



# 4<sup>TH</sup> INTERNATIONAL FORUM

## ON RESEARCH AND TECHNOLOGIES FOR SOCIETY AND INDUSTRY

**Polytechnic School  
of the  
University of Palermo**  
**9 | 10-13 | 2018**  
h 9 am > 5 pm  
Viale delle Scienze  
Palermo, Italy

**INNOVATION TO SHAPE  
THE FUTURE**





# Technical Program

## RTSI 2018 — 4th International Forum on Research and Technologies for Society and Industry

Innovation to shape the future  
Palermo, Italy, September 10-13, 2018



UNIVERSITÀ  
DEGLI STUDI  
DI PALERMO



Dipartimento di Energia, ingegneria  
dell'Informazione e modelli Matematici





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## General Chairs' Welcome Message

It is our great pleasure to welcome you to the Fourth Edition of the International IEEE Forum on Research and Technologies for Society and Industry (RTSI) that is taking place in Palermo, Italy, from Monday September 10th until Thursday September 13th, 2018. The RTSI is the flagship conference of the IEEE Italy Section and represents the annual gathering of researchers and industry professionals in the field of electrical, electronic, and information science and engineering.

The theme chosen for the 2018 edition of RTSI is "Innovation to shape the future", a challenge based on three areas of great interest and relevance: Sustainable development for cities and environment, Smart emerging technologies for Industry 4.0, ICT for future networks. Undoubtedly, innovation in electrical, electronic, and information science and engineering has fundamentally transformed our society in recent decades and the pace of change can only be described as disruptive. Not only technologies, but also economies and societies are continually shaped by innovation. Based on these evidences, the core purpose of RTSI is to foster technological innovation and excellence in the fields of electrical, electronic, information science and engineering.

Specifically, the main purposes of the event are:

- to promote and to strengthen partnerships and cooperation between academia and industry;
- to increase the public's understanding and awareness of how engineering and technology can positively affect quality of life;
- to promote discussion between the research community and government bodies about effective and successful research policies;
- to disseminate recent advancements, discoveries and applications;
- to discuss ideas and to promote cooperation between researchers working in different research areas.

RTSI includes panels, technical sessions, tutorials, special events and exhibitions, as reported in detail in the technical program. This year we have, for the first time, the technical sponsorship of IEEE Region 8 with three European Sections (France, Switzerland and UK&Ireland) beside numerous technical sponsorship from chapters and university association.

The Award Ceremony, this year will be enriched with awards from the Section, Chapters and sponsored by industries. ST contributes to the Young professional competition and the corporate sponsor ABB supports financially six prestigious awards for PhD and Master thesis.

In addition to the stimulating program of the conference, Palermo, Italian Capital of Culture 2018, with its tourist attractions, the quality of its cuisine, and historical monuments, is an unforgettable place. We hope you get a chance to visit this beautiful city.

We would like to give a warm welcome to all the participants to RTSI and look forward to meeting you over the four days of the forum.

Enjoy RTSI 2018 @Palermo!

Warmest Regards,

Tiziana Tambosso

Guido Ala

## Technical Program Committee Chairs' Welcome Letter

The Technical Program of the fourth edition of RTSI is very rich: it includes 27 technical sessions with 138 contributed papers, 29 invited talks and keynote speakers, five tutorials on very hot topics, 3 panels in which industries and universities debate on topics like:

- Smart energy systems for smart city districts,
- Smart Technologies & Best Practices for Industry 4.0 and Digital Transformation
- ICT at the service of the citizen: best practices and business cases;
- 

and a Special meeting on innovative start up & entrepreneurs in which incubators, associations and foundations can share their ideas for nurturing a favourable ecosystem toward an altruistic model of economy.

In addition the program includes:

- a Young Professional Demo Competition with the focus on innovative prototype implementations, systems and technologies in a broad range of fields that include all the themes belonging to RTSI;
- a WIE event: titled "Steering girls to STEM", organized by the IEEE Women in Engineering Italian Affinity Group in cooperation with other two Italian Associations AICA and AELIT;
- The IEEE Student Branch Meeting organized by the IEEE Italy Section SB coordinator with the objective to bring together the Italian Student Branches sharing their best practices and also offering the students the opportunity to follow an international and interdisciplinary conference;
- The Meeting with Industries with the objective to inform all participants of the initiatives that IEEE Region 8 (Europe, Africa and Middle East) and IEEE Italy Section are promoting in favor of industries. Such event will include presentations by ST, an industry already involved in joint programs with IEEE, and by IEEE France Section reporting on their actions for industries. The meeting will end with an open discussion with the participant industries on new ideas and proposals of common interest.

We would like to thank all technical sponsors for their support and promotion, the track chairs and session chairs for their essential work of organization and management of the technical sessions, all the reviewers who assured a high quality of papers. Special thanks are also due to the chairs of the tutorial, panels and YP Event for their valuable work.

Last but not least, a special thank to the organizing team of the University of Palermo whose effective contribution and enthusiastic work ensured the realization of this event.

Hope you all can enjoy RTSI 2018!

With our best regards,

Bernardo Tellini

Gaetano Zizzo

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Maria-Alexandra Paun, Switzerland Section  
Chair

Luigi Rovati, RTSI 2017 Chair

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Bernardo Tellini, IEEE Italy Section Vice-Chair

### Technical Program Committee co-Chair

Gaetano Zizzo, University of Palermo

### Track Chairs

#### TRACK 1: SUSTAINABLE DEVELOPMENT FOR CITIES AND ENVIRONMENT

Fabio Massaro, University of Palermo

Giambattista Gruosso, IEEE Italy Section

#### TRACK 2: SMART EMERGING TECHNOLOGIES FOR INDUSTRY 4.0

Mauro Mosca, University of Palermo

Leopoldo Angrisani, IM Chapter chair

#### TRACK 3: ICT FOR FUTURE NETWORKS

Dajana Cassioli and Fabrizio Granelli,  
COM/VT Chapter Chair

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University of Palermo

### Tutorial Chair

Salvatore Favuzza, University of Palermo

### Exhibition Chair

Salvatore Favuzza, University of Palermo  
Fabio Montagnino, Consorzio ARCA

### Publicity Chair

Vincenzo Di Dio, University of Palermo

### Publication Chair

Daniela Proto, IEEE Italy Section

### Special meeting for innovative start-up & entrepreneurs

Vincenzo Di Dio, University of Palermo

Giovanni Perrone, President PNICube

Pietro Erratico, IEEE Italy Section Aff  
Coordinator

### Women in engineering affinity group meeting

Dajana Cassioli, IEEE Italy Section WIE-AG  
Chair

### Young Professional Demo Competition Event

Ferdinando Nunziata, IEEE Italy Section,  
YP-AG Chair

### Student Activity

Marco Santambrogio, IEEE Italy Section SAC  
Coordinator

### Treasurer

Sergio Rapuano IEEE Italy Section Treasurer

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Pietro Romano, University of Palermo

Gaetano Zizzo, University of Palermo

**Webmaster**

Gabriele Adamo, University of Palermo

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Salvatore Coco, University of Catania

Francesco Conte, University of Genova

Giuseppe Conte, Università Politecnica delle Marche

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Damiano Varagnolo, Luleå University of Technology

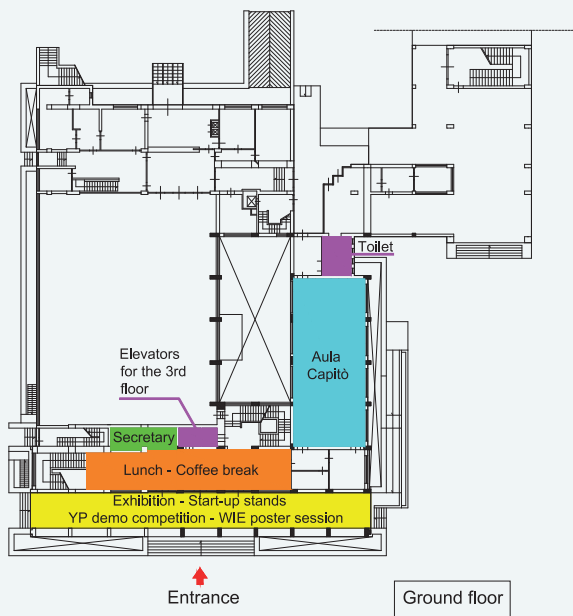
Ana Lucia Varbanescu, University of Amsterdam  
Filippo Zerboni, Mobi Med  
Gaetano Zizzo, University of Palermo

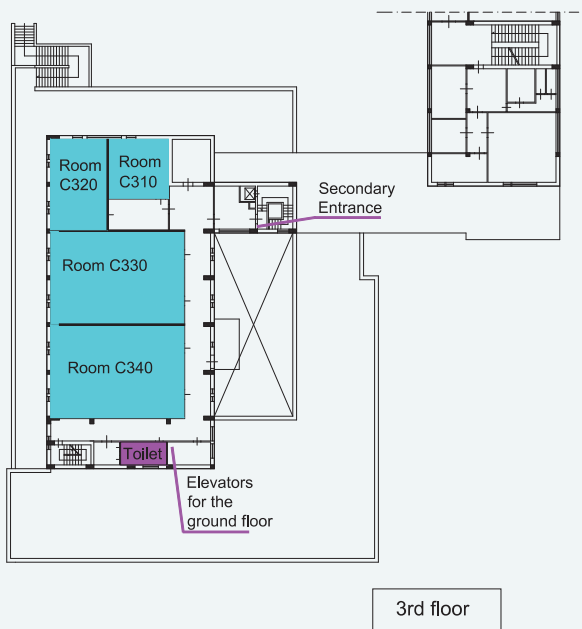
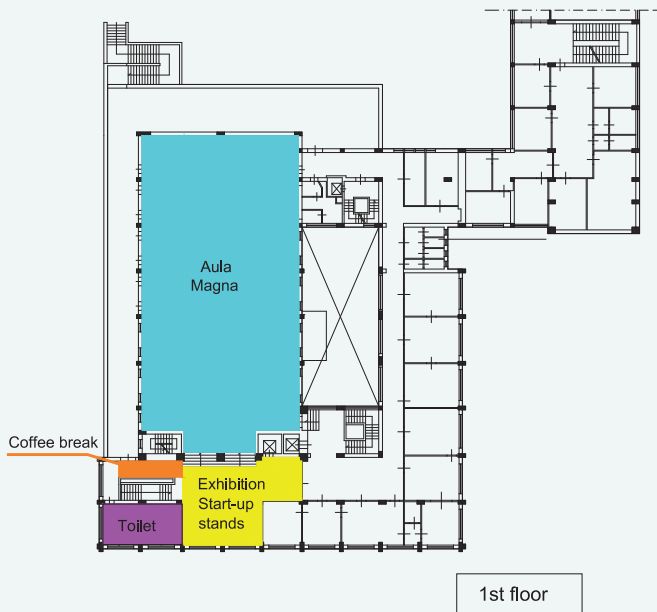
## Campus of the University of Palermo

Viale delle Scienze, Building 7  
90128 - Palermo, Italy

The main conference rooms are located at the University Campus at Building 7.

The Campus of the University of Palermo comprises several departments and is characterized by the presence of beautiful gardens, car parks and various services for students, teachers and guests. Building 7 is the house of the administrative offices of the Scuola Politecnica of the University of Palermo and offers six rooms for the conference, with all the multimedia equipments for the speakers, wifi access and air conditioning systems. The rooms are located at the ground floor (Aula Capitò), at the first floor (Aula Magna) and at the third floor (rooms C310, C320, C330 and C340) as indicated in the figures below.





## Welcome Reception

The Botanical Garden  
Via Lincoln 2  
90123 – Palermo (Italy)

The Botanical Garden of the University of Palermo is one of the most important academic institutions in Italy.

Considered a huge open-air museum, it boasts over two hundred years of activity that allowed it to be studied in Sicily, Europe and across the Mediterranean sea, of countless plant species, many of which originate in tropical and subtropical regions.

The peculiarity of this Garden is today represented by the great richness of host species that make it a very rich place of different flora expressions. It is part of the Museum System Services Center of the University of Palermo.

## Gala Dinner

Palazzo Fatta  
Piazza Marina 19  
90133 – Palermo (Italy)

Philological and cartographic information, combined with ancient and recent findings in the subsoil adjacent to the area where the palace stands, lead to the hypothesis that part of this is based on very ancient structures that, in all probability, were part of the defense Arab city. After the internal harbor had been built up to the sixteenth century, due essentially to the detritus brought by the Kemonia and Papireto streams, the so-called "Navy Plan" was formed, an urban void that has remained largely unpublished to this day. The first urbanization in the Palazzo area can be dated between the 16th and 17th centuries, when the cartography began to represent some constructions along the western side of the Plan.

It was an aggregation of buildings of modest size and architectural quality, which gradually became organized in courtly residences thanks to urban regulations that allowed the acquisition of houses and warehouses for the sole purpose of creating buildings and improving the quality of the city. We know of a seventeenth-century Domus

Magna, which had already belonged to noble families and was enlarged several times, which was further enriched in 1731-1733 when the new owner, Lucio Denti di Piraino, Prince of Castellazzo, raised and unified the existing factories; he added on the free head a large terrace on arched portico, able to give the building a strong architectural characterization and a comfortable view of the Navy Floor, a place for party shows, but also for the horrific public executions.

The chronicles of the time refer to how Viceroy was repeatedly invited to attend the street demonstrations. Salvatore Calderone, baron of Baucina, bought the palace in 1769, embellishing it with those works of great value that can still be admired today, especially the dance hall, called "the Gallery".

This was decorated with a basque panel decorated with rococo motifs, large painted overlays within complex golden baroque frames and majolica floors produced in Naples, as well as other rooms, from the living room adjacent to the alcove, also equipped with painted paintings. For the ceiling of the gallery Antonio Manno was called, considered the most successful pupil of Vito D'Anna in those years that failed; he created and signed a striking decorative arrangement composed of the central scene within an elegant

stucco and gold frame in which the virtues of the family were exalted, surrounded by compartments with allegorical themes and architectural elements.

The autograph sketch of the work has recently been found, which we know served at Manno to obtain the much desired admission at the Accademia di San Luca in Rome and the subsequent appointment as an Academician. It is due to Francesco and Giovanni Fatta, barons of the Fratta, who came into possession of the building in 1857, the configuration of the current volume, resulting from the completion of the third floor and recomposition according to a unified design of the elevations: iconographies of the mid-nineteenth century show with all evidence the presence of two building units recognizable in autonomous architectural characters. The need for renewal imposed the replacement of shelves, railings, frames, exhibitions and other baroque elements with the simple and pure lines of the neoclassical taste that had long established itself in the city.

The new altimetric layout of the square, designed by G. B. F. Basile, forced the closing of the high portico under the terrace. Lastly, Ernesto Basile's interventions of 1908 can be considered significant, both in the reconfiguration of the entrance hall where they can still admire ferrate, posters, stained glass and coffered ceiling, and in the finishes of the large well staircase. Recent restoration interventions have allowed us to rediscover and reproduce the polychrome of the exteriors that the maintenance of a century had hidden, but not canceled: from the white stucco of the upper floors, to the rich gray-blue stucco on the ground floor, to the azure lapis lazuli all The interior of the rosettes that decorate the facade above the terrace are all elements that, with the measured elegance of the shapes, contribute to the qualification of the urban surroundings.

## **General Information**

### **Registration**

The registration fee includes admission to RTSI technical and special sessions, Tutorials, Panels, Exhibition, Coffee Breaks, Lunch, Welcome Reception and Social Dinner.

The Check-In is located at the ground floor of Building 7.

It will be open every day in the time of the conference.

### **Presentation Upload**

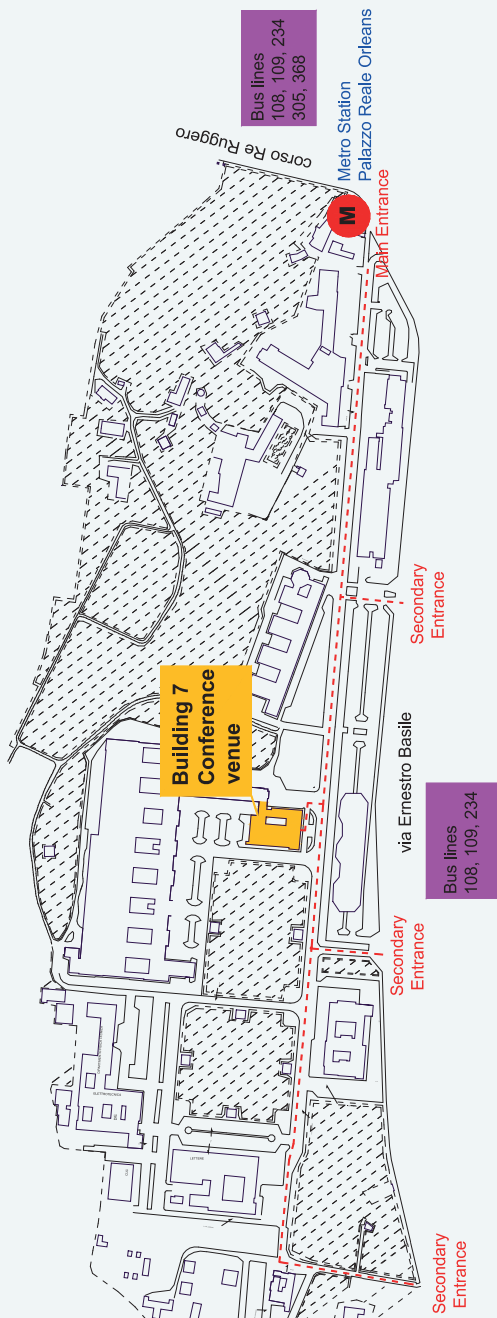
Oral presentations are organized in sessions scheduled in specific lecture rooms, indicated in the programme together with the time of presentation of each contribution including discussion and change-over. Please note that the duration given to contributed oral presentation includes 3 minutes for questions and discussion (e.g. a 15-minute talk should be 12 minutes of presentation + 3 minutes of discussion). Duration of invited talks is 30 minutes including 5 minutes for questions and discussion. The oral presentations are not organized centrally. Therefore, the authors are kindly asked to upload their presentations directly in the respective lecture room 30 minutes prior to the time block of the session. A lecture room assistant will be available if you need help.

We recommend the use of PDF Presentation for all speakers with a slide ratio 4:3.

## **Proceedings of RTSI 2018**

Conference registrants will have access to the full proceedings of accepted authors and invited speakers. The book of accepted proceedings will be made available electronically to all attendees thanks to a password protected link that will expire once the conference ends.

## Map of the Campus



## Agenda

Monday September 10						
Time	Foyer	Aula Magna	Room C330 Track 1	Room C340 Track 2	Room C320 Track 2&3	Aula Capito
9:00 - 10:30	<b>Exhibition &amp; YP Event</b>	<b>Welcome Session &amp; Keynote Speech:</b> Energy efficiency improvement for electrical machines: a challenge <i>Gerard-Andre Capolino</i>				
10:30 - 12:30		<b>Tutorial Track 1:</b> Towards connected vehicles enabled smart transportation <i>S. Djahel</i>	<b>Smart electric energy systems</b>	<b>Biomechanical models in tissue engineering</b>	<b>Photonic technologies for industry 4.0</b>	
12:30 - 13:00		<b>Exhibition &amp; YP Demo Competition Time</b>				
13:00 - 14:00		Lunch				
14:00 - 16:00		<b>Panel 1</b> - Chair - <i>Carlo Alberto Nucci</i> - “Smart grids and energy systems for smart city districts”				
16:00 - 16:30		Coffee Break				
16:30 - 18:30			<b>Power Electronics and Drives for Sustainable Transportation</b>	<b>Robotics and autonomous systems</b>	<b>Sensor networks</b>	<b>Meeting with Industry</b>
19:30 - 21:30	<b>Welcome Reception:</b> The Botanical Garden - Palermo					

## Tuesday September 11

Time	Foyer	Aula Magna	Room C330 - Track 1	Room C340 – Track 2	Room C320 - Track 3	Aula Capitò
9:00 - 10:30	Exhibition & YP Event		Electricity from renewable energy (A)	Advanced numerical modelling (A) - Power- awareness and resource management in mobile and IoT computing systems	Experimental research and prototyping towards 5G and beyond	Student Branch meeting
10:30 - 11:00		Coffee Break				
11:00 - 13:00		Panel 2 - Chairs - <i>Leopoldo Angrisani and Mauro Mosca</i> – “Smart Technologies & Best Practices for Industry 4.0 and Digital Transformation”				
13:00 - 14:00		Lunch				
14:00 - 14:30		Exhibition & YP Demo Competition Time				
14:30 - 16:30	Exhibition	Tutorial Track 2: Additive manufacturing and 3D printing for medicine: experiences and opportunities <i>F. Auricchio</i>	Electricity from renewable energy (B) - Smart net zero energy buildings	Advanced numerical modelling (B)	Blockchain technologies: challenges and opportunities	Student Branch and student events
16:30 - 17:00		Coffee Break				
17:00 - 19:00			Advanced materials for photovoltaic applications	Computer vision	Contact Management in connected Society & Enterprises	Student Branch and student events



## Wednesday September 12

Time	Foyer	Aula Magna	Room C330 - Track 1	Room C340 - Track 2	Room C320 - Track 3	Aula Capitò
9:00 - 11:00	Exhibition	<b>Tutorial:</b> Ethical considerations in system design <i>A.G. Hessami</i>	Remote sensing models and methods to support sustainable development and disaster management (A)	Nanotechnologies for industry 4.0 (A)	5G, from technology to its enabled applications	WIE event
11:00 - 11:30		Coffee Break				
11:30 - 13:00		<b>Tutorial:</b> The role of the Competence Center in the Industry 4.0 Plan <i>F. Dughiero</i> <i>L. Angrisani</i>	Remote sensing models and methods to support sustainable development and disaster management (B)  Smart communities for resilient and innovative cities	Nanotechnologies for industry 4.0 (B)	High Integrity and High Accuracy for Intelligent Transportation Systems	WIE event
13:00 - 14:00		Lunch				
14:00 - 14:30		Exhibition Time				
14:30 - 16:15		SPECIAL MEETING ON INNOVATIVE STARTUP & ENTREPRENEURS				
16:15 - 16:45		Coffee Break				
16:45 - 19:00		SPECIAL MEETING ON INNOVATIVE STARTUP & ENTREPRENEURS				
20:00 - 23:00		Social Dinner & Award Ceremony: “Palazzo Fatta”, Piazza Marina, Palermo				

## Thursday September 13

Time		Aula Magna	Room C330 - Track 1	Room C340 – Track 2	Room C320 - Track 2-3	Aula Capito
9:00 - 10:30		<b>Tutorial Track 3:</b> Machine-Type Communications (MTC) in 5G: challenges, algorithmic design and performance analysis <i>M. Assaad</i>	<b>Sustainable marine transportation</b>	<b>Compliant non-destructive testing</b>	<b>Safety, Security and Privacy for Cyber-Physical Systems</b>	
10:30 - 11:00		Coffee Break				
11:00 - 13:00		<b>Panel 3</b> - Chairs: <i>Dajana Cassioli and Fabrizio Granelli</i> - “ICT at the service of the citizen: best practices and business cases”				
13:00 - 14:00		Lunch				
14:00 - 16:30			<b>Environmental monitoring and prediction</b>	<b>Smart technologies and modelling for avionics</b>	<b>Telemedicine and e-Health: medical image data and datasets into healthcare interoperability with IoT</b>  <b>Distributed ICT for health and wellness</b>	
16:15 - 16:45		<b>Closing Session</b>				
16:45 - 18:45		<b>Room C310</b> <b>ITALY SECTION EXCO</b> with Coffee Break				

## Technical Sessions

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### Monday September 10

#### Welcome Session and Keynote Speech:

Gerard-Andre Capolino

(IEEE Fellow Chair Professor of Electrical Engineering)

*Energy efficiency improvement for electrical machines: a challenge*

*Aula Magna*

*9.00-10.30*

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#### Smart electric energy systems

Chairs: Eleonora Riva Sanseverino (University of Palermo) and Stefano Massucco (University of Genova - PES chapter Chair)

Monday September 10, 10.30-12.45  
Room C330

- 10.30-11.00 ***Invited: From an idea to a true company***  
Roberto Candela (Prysmian Electronics).
- 11.00-11.15 ***A battery-free smart sensor powered with RF energy***  
Roberto La Rosa, Giulio Zoppi, Loreto Di Donato, Gino Sorbello, Calogero Di Carlo, Patrizia Livreri.
- 11.15-11.30 ***Performance analysis of distributed control strategies for frequency regulation support by domestic thermal loads***  
Monica Crosa di Vergagni, Francesco Conte, Stefano Massucco, Federico Silvestro, Diego Cirio, Emanuele Ciapessoni.
- 11.30-11.45 ***On the application of partial waveforms technique to electric vehicles battery chargers modeling***  
Roberto Langella, Alfredo Testa, Vincenzo Di Giorgio.
- 11.45-12.00 ***Urban energy hubs economic optimization and environmental comparison in Italy and Vietnam***  
Giuseppe Attardo, Sonia Longo, Francesco Montana, Eleonora Riva Sanseverino, Quynh Tran, Gaetano Zizzo.
- 12.00-12.15 ***Zone reactive power controller***  
Jasna Dragosavac, Zarko Janda, Vladimir Shiljkut, Zoran Ciric.
- 12.15-12.30 ***Design and characterization of a new MV PLC coupler for smart electric energy systems***  
Giovanni Artale, Antonio Cataliotti, Valentina Cosentino, Dario Di Cara, Riccardo Fiorelli, Salvatore Guaiana, Nicola Panzavecchia, Giovanni Tinè.

- 12.30-12.45 ***Power network modelling for hardware in the loop and real time applications***  
Zarko Janda, Jasna Dragosavac, Zoran Ciric, Miroslav Dragicevic.
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### **Biomechanical models in tissue engineering**

Chair: Massimiliano Zingales (University of Palermo)

Monday September 10, 10.30-12.45  
Room C340

- 10.30-11.00 ***Invited: Sensing scaffolds for cell monitoring in tissue engineering***  
Nicola Lopomo (University of Brescia, Italy).
- 11.00-11.15 ***Quasi-fractional models of human tendons hereditariness***  
Emanuela Bologna, Gioacchino Alotta, Luca Deseri, Massimiliano Zingales.
- 11.15-11.30 ***A non-local mode-I cohesive model for ascending thoracic aorta dissections (ATAD)***  
Gioacchino Alotta, Francesco Pinnola, Emanuela Bologna, Rossana Dimitri, Massimiliano Zingales, Giorgio Zavarise, Marzio Di Giuseppe.
- 11.30-11.45 ***Numerical simulations of the hydrodynamics of the abdominal aorta aneurysm using a smoothed particle hydrodynamics code with deformable walls***  
Costanza Aricò, Gioacchino Alotta, Massimiliano Zingales, Enrico Napoli, Alessandra Monteleone, Robert Nagy.
- 11.45-12.00 ***Novel nanobiocomposite hydrogels based on gelatin/chitosan and conductive carbon black***  
Luciana Sartore, Kamol Dey, Sarah Tonello, Nicola Francesco Lopomo, Domenico Russo.
- 12.00-12.15 ***Experimental characterization of the human meniscal tissue***  
Olga Barrera, Massimiliano Zingales, Emanuela Bologna, Gioacchino Alotta
- 12.15-12.30 ***Composite scaffolds with a hydrohyapatite spatial gradient for osteochondral defect repair***  
Vincenzo La Carrubba, Angela De Luca, Gianluca Giavaresi, Francesco Carfi Pavia, Gioacchino Conoscenti, Valerio Brucato.
- 12.30-12.45 ***Hereditariness of aortic tissue: In-vitro time-dependent failure of human and porcine specimens***  
Marzio Di Giuseppe, Salvatore Pasta, Emanuela Bologna, Massimiliano Zingales, Gioacchino Alotta.
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### **Photonic technologies for industry 4.0**

Chairs: Alessandro Busacca (University of Palermo) and Silvia Maria Pietralunga (IFN-CNR Milano - PHO Chapter Chair)

Monday September 10, 10.30-12.30  
Room C320

- 10.30-11.00 ***Invited: High efficiency Si - HJT solar cells: innovative PV technology for reducing energy generation costs***  
Cosimo Gerardi (3SUN)

- 11.00-11.30 ***Invited: Distributed fiber sensing techniques for the power cable industry***  
Fabrizio Bucccheri (Prysmian Electronics).
- 11.30-11.45 ***Reliability of linear complexity measures of pulse rate variability***  
Riccardo Pernice, Luca Faes, Alessandro Busacca, Michal Javorka, Jana Krohova, Barbora Czippelova, Zuzana Turianikova.
- 11.45-12.00 ***Fabrication and characterization of donor/acceptor heterojunction organic solar cells*** Pasquale Cusumano
- 12.00-12.15 ***A LiDAR prototype with silicon photomultiplier and mems mirrors***  
Gabriele Adamo, Leonardo Mistretta, Patrizia Livreri, Alessandro Busacca.
- 12.15-12.30 ***Evolution of laser ablation plume measured by self-mixing interferometry***  
Simone Donadello, Ali Gökhan Demir, Barbara Previtali.

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### **Exhibition & YP Demo Competition Time**

Monday September 10, 12.30-13.00

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### **Lunch**

13.00-14.00

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### **Panel 1**

#### **“Smart grids and energy systems for smart city districts”**

Chair - Carlo Alberto Nucci

Monday September 10, 14.00-16.00

Aula Magna

#### ***Introduction and overview on smart energy systems and smart cities***

Carlo Alberto NUCCI, Alma Mater Studiorum –University of Bologna

#### ***Digitalisation, decarbonisation, distributed renewable generation: on the interaction of the 3 “d” of the energy sector with the concept of life cycle***

Maurizio CELLURA, University of Palermo

#### ***The need to be “Smart”: a challenge for DSOs towards the implementation of digital technologies on networks***

Dario DALL'ACQUA, e distribuzione S.p.A.

#### ***Eni approach to sustainable mobility***

Vincenzo PICCOLO, Eni S.p.A.

#### ***Open Discussion***

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### **Coffee Break**

16.00-16.30

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## Power Electronics and Drives for Sustainable Transportation

Chair: Marco Di Benedetto (University of Roma Tre) and Patrizia Livreri (University of Palermo)

Monday September 10, 16.30-18.15

Room C330

- 16.30-17.00 ***Invited: Bidirectional converter topologies for low-voltage battery interface: a comparison***  
Paolo Mattavelli (University of Padova).
- 17.00-17.15 ***Intelligent gate driver for a modular three-phase matrix converter***  
Alvise Zorzi, Marco Salvini.
- 17.15-17.30 ***Bidirectional DC-DC converter topologies for low-voltage battery interface: comparative assessment***  
Ahmed Abdelhakim, Paolo Mattavelli, Giorgio Spiazzi, Simone Pistollato.
- 17.30-17.45 ***Design of a battery/ultracapacitor energy storage system for electric vehicle applications***  
Patrizia Livreri, Vincenzo Castiglia, Rosario Miceli, Filippo Pellitteri
- 17.45-18.00 ***Novel GaN based solid state power amplifiers, results, advances and comparison with vacuum tubes based microwave power modules***  
Patrizia Livreri, Marco Li Vecchi, Francesco Di Maggio, Antonino Spatola, Rosario Martorana, Antonio Mistretta.
- 18.00 -18.15 ***Performance of lead-acid batteries with nanostructured electrodes at different temperature***  
Mariagrazia Insinga, Simone Pisana, Carmelo Sunseri, Rosalinda Inguanta, Roberto Oliveri.
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## Robotics and Autonomous Systems

Chairs: Adriano Fagiolini (University of Palermo) and Lucia Pallottino (University of Pisa - RA Chapter Chair)

Monday September 10, 16.30-18.15

Room C340

- 16.30-17.00 ***Invited: It's not MPC ! An explicit reference governor for the supervision of constrained nonlinear systems***  
Emanuele Garone (Université Libre de Bruxelles)
- 17.00-17.15 ***ROS/Gazebo-based simulation of quadcopter aircraft***  
Claudio Sciortino, Adriano Fagiolini.
- 17.15-17.30 ***A planning and control system for self-driving racing vehicles***  
Danilo Caporale, Adriano Fagiolini, Lucia Pallottino, Alessandro Settini, Andrea Biondo, Francesco Amerotti, Federico Massa, Stefano De Caro, Andrea Corti, Luca Venturini.

- 17.30-17.45 ***Explicit Reference Governor Toolbox (ERGT)***  
Andres Cotorruelo, Daniel Limon, Marco Nicotra, Emanuele Garone.
- 17.45-18.00 ***A cognitive architecture for social robots***  
Ignazio Infantino, Agnese Augello, Umberto Maniscalco, Giovanni Pilato, Filippo Vella.
- 18.00 -18.15 ***Wearable augmented reality and brain computer interface to improve human-robot interactions in smart industry: a feasibility study for ssvep signals***  
Nicola Moccaldi, Pasquale Arpaia, Leopoldo Angrisani, Antonio Esposito
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### Sensor networks

Chairs: Filippo D'Ippolito (University of Palermo) and David Scaradozzi (Polytechnic University of region Marche)

Monday September 10, 16.30-18.00  
Room C320

- 16.30-17.00 ***Invited: Distributed estimation based on multi-hop subspace decomposition***  
Luca Zaccarian (University of Trento)
- 17.00-17.15 ***Geometrical optimization of Hall effect sensors for use in energy and power meters***  
Maria-Alexandra Paun, Vladimir-Alexandru Paun.
- 17.15-17.30 ***Hybrid observer for indoor localization with random time-of-arrival measurements***  
Francesco Alonge, Filippo D'Ippolito, Giovanni Garraffa, Antonino Sferlazza
- 17.30-17.45 ***Improved PDR localization via UWB-anchor based on-line calibration***  
Laura Giarré, Federica Pascucci, Simone Morosi, Alessio Martinelli.
- 17.45-18.00 ***A complete IoT infrastructure to ensure responsible, effective and efficient execution of field survey, documentation and preservation of archaeological sites***  
Silvia Zingaretti, David Scaradozzi.
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### Meeting with Industry

Monday September 10, 16.30-18.30  
Aula Capito

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### Welcome Reception

19.30 – 21.30  
Botanical Garden of the University of Palermo

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## Tuesday September 11

### Electricity from renewable energy (A)

Chairs: Marco Trapanese (University of Palermo) and Gaetano Zizzo (University of Palermo)

Tuesday September 11, 9:00-10:30  
Room C330

- 9.00-9.30     ***Invited: Smart solutions for balancing power grid with high penetration of renewable***  
Diego Arnone (Engineering Ingegneria Informatica SpA)
- 9.30-9.45     ***Technical solutions and standards upgrade for photovoltaic systems operated over 1500 Vdc***  
Lorenzo Scarpa, Pietro Tumino, Marco Nunnari, Gianfranco Chicco, Filippo Spertino.
- 9.45-10.00    ***An analysis of the inertial response of small isolated power systems in presence of generation from renewable energy sources***  
Gaetano Zizzo, Eleonora Riva Sanseverino, Salvatore Favuzza, Rossano Musca, Milagros Navarro Navia, Massimo Bongiorno, Mariano Giuseppe Ippolito.
- 10.00-10.15   ***System stability of a small island's network with different levels of wind power penetration***  
Gaetano Zizzo, Eleonora Riva Sanseverino, Milagros Navarro Navia, Mariano Giuseppe Ippolito, Salvatore Favuzza, Rossano Musca, Massimo Bongiorno.
- 10.15-10.30   ***H-bridge inverter with modified perturb and observe (p&o) fuzzy logic control (flc) based-MPPT technique for grid-connected photovoltaic system***  
Faranadia Abdul Haris, Siti Zaleha Mohd Noor.

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### Advanced numerical modeling (A)

Chairs: Elisa Francomano (University of Palermo) and Antonino Laudani (University of Roma TRE)

Tuesday September 11, 9.00-10.30  
Room C340

- 9.00-9.30     ***Invited: FLARECAST: an I4.0 technology for space weather using satellite data***  
Michele Piana (University of Genova).
- 9.30-9.45     ***Analytical approach to the calculation of parasitic capacitance between winding turns*** Antonio Massarini.
- 9.45-10.00    ***Parallelization of the hierarchical alternating least squares algorithm for nonnegative matrix factorization***  
Markus Flatz, Rade Kutil, Marian Vajtersic.
- 10.00-10.15   ***Smooth and sparse inversion of EMI data from multi-configuration measurements***  
Gian Piero Deidda, Patricia Díaz de Alba and Giuseppe Rodriguez, Giulio Vignoli.

- 10.15-10.30 ***Neural networks for maximum power point tracking***  
Manuele Bertoluzzo, Mattia Forato, Francesco Riganti Fulginei, Gabriele Maria Lozito, Maria Evelina Mognaschi, Elisabetta Sieni, Manuel Zordan.
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### **Experimental research and prototyping towards 5G and beyond**

Chairs: Ilenia Tinnirello (University of Palermo) and Luiz Da Silva (Trinity College Dublin)

Tuesday September 11, 9.00-10.30  
Room C320

- 9.00-9.30 ***Invited: Towards the next generation of wireless networking testbeds***  
Ivan Seskar (Rutgers University).
- 9.30-9.45 ***End to end 5G measurements with MONROE: challenges and opportunities***  
Ozgu Alay, Vincenzo Mancuso, Anna Brunstrom, Stefan Alfredsson, Marco Mellia, Giacomo Bernini, Håkon Lønsethagen.
- 9.45-10.00 ***A framework for intelligent spectrum sharing***  
Felipe Augusto Pereira de Figueiredo, XianJun Jiao, Wei Liu, Irfan Jabandzic, Spilios D. Giannoulis, Ingrid Moerman.
- 10.00-10.15 ***Internet of things for environmental monitoring based on radio over fiber***  
Carlos A. Astudillo, Tiago Andrade, Eduardo S. Gama, Luiz F. Bittencourt, Leandro Aparecido Villas, Edmundo Madeira, Nelson L. S. da Fonseca.
- 10.15-10.30 ***Wi-Dia: data-driven wireless diagnostic using context recognition***  
Pierluigi Gallo, Domenico Garlisi.
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### **Student Branch meeting**

Tuesday September 11, 9.00-10.30  
Aula Capitò

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### **Coffee Break**

10.30-11.00

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### **Panel 2**

#### **“Smart Technologies & Best Practices for Industry 4.0 and Digital Transformation”**

Chairs - Leopoldo Angrisani and Mauro Mosca

Tuesday September 11, 11.00-13.00  
Aula Magna

***Italian industry 4.0 plan: current scenario and open issues***  
Leopoldo Angrisani, University of Napoli Federico II

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***Certification of industry 4.0 practices: RINA proposals***

Antonio Ferraro, RINA

***Best practices @ CCLAA Palermo for helping SMEs***

Alessandro Albanese, CCLAA Palermo

***A success story: strategic goals in the distillation field***

Maria Giovanna Gulino, Sicindustria –Distilleria Bertolino

***Smart reconfiguration of shipboard power systems***

Massimo Cossentino, CNR

***A Success story: excellence and innovation for smart rail interiors***

Giuseppe Russello, OMER

***Open Discussion***

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**Lunch**

13.00-14.00

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**Exhibition & YP Demo Competition Time**

Tuesday September 11, 14.00-14.30

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**Electricity from renewable energy (B)**

Chairs: Marco Trapanese (University of Palermo) and Gaetano Zizzo (University of Palermo)

Tuesday, September 11, 14.30-15.45

Room C330

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|-------------|---|
| 14.30-14.45 | <b><i>Energy savings and sustainable approach using renewable energy in desalination application</i></b><br>Marco Trapanese, Domenico Curto.  |
| 14.45-15.00 | <b><i>Sea wave energy exploitation in the mediterranean sea</i></b><br>Marco Trapanese, Alessia Viola.  |
| 15.00-15.15 | <b><i>Realization of an energetic hub based on a high-performance dish stirling plant</i></b><br>Vincenzo Di Dio, Giovanni Cipriani, Giuseppina Ciulla, Valerio Lo Brano, Vincenzo Di Maria, Christian Chiaruzzi, Agostino Costantino, Ignazio Manduca, Gunnar Larsson. |
| 15.15-15.30 | <b><i>Performance enhancement of alkaline water electrolyzer using nanostructured electrodes synthesized by template electrosynthesis</i></b><br>Fabrizio Ganci, Valentino Cusumano, Carmelo Sunseri, Rosalinda Inguanta.   |
| 15.30-15.45 | <b><i>Energy efficiency for autonomic scalable systems: research objectives and preliminary results</i></b><br>Rolando Brondolin, Marco Arnaboldi, Tommaso Sardelli, Sara Notargiacomo, Marco D. Santambrogio.  |
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## Smart net zero energy buildings

Chairs: Maurizio Cellura (University of Palermo) and Stefano Massucco (University of Genova- PES chapter Chair)

Tuesday September 11, 15.45-16.45  
Room C330

- 15.45-16.00 ***Analysis of load match in nearly zero energy buildings A parametric analysis of an italian case study***  
Giovanni Tumminia, Marco Ferraro, Davide Aloisio, Nicola Giordano, Francesco Guarino, Francesco Sergi, Sonia Longo, Maurizio Cellura, Vincenzo Antonucci..
- 16.00-16.15 ***Nearly zero energy hotels in a mediterranean area: a new economic approach***  
Francesco Nocera, Salvatore Giuffrida, Antonio Gagliano, Bruno Messina.
- 16.15-16.30 ***Model-free control of data center compressor-based cooling systems***  
Mirco Rampazzo and Michele Lionello, Fernando Carpignani Panebianco, Alessandro Beghi.
- 16.30-16.45 ***Design and validation of a detailed building thermal model considering occupancy and temperature sensors***  
Andrea Bagnasco, Stefano Massucco, Matteo Saviozzi, Federico Silvestro, Andrea Vinci.
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## Advanced numerical modelling (B)

Chairs: Elisa Francomano (University of Palermo) and Antonino Laudani (University of Roma TRE)

Tuesday September 11, 14.30-16.15  
Room C340

- 14.30-15.00 ***Invited: A locally recurrent neural network based approach for the early fault detection***  
S. Carcangiu (University of Cagliari), Augusto Montisci
- 15.00-15.15 ***Numerical solution of electromagnetic scattering problems based on the dirichlet-to-neumann map***  
Antonio Maffucci, Antea Perrotta, Salvatore Ventre, Antonello Tamburrino.
- 15.15-15.30 ***EIS method for the on-board evaluation of the fuel cell impedance***  
Giovanni Petrone, Walter Zamboni, Giovanni Spagnuolo, Riccardo Dessi.
- 15.30-15.45 ***The benchmark TEAM problem for multi-objective optimization solved with CFSO***  
Paolo Di Barba, Fabrizio Dughiero, Gabriele Maria Lozito, Maria Evelina Mognaschi, Alessandro Salvini, Elisabetta Sieni.
- 15.45-16.00 ***Data-driven approaches to predict states in a food technology case study***  
Annalisa Romano, Rosanna Campagna, Paolo Masi, Salvatore Cuomo, Gerardo Toraldo.
- 16.00-16.15 ***Equivalent circuit modelling of ferrite inductors losses***  
Salvatore Federico Roberto, Daniele Scire', Giuseppe Lullo, Gianpaolo Vitale.

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## Blockchain technologies: challenges and opportunities

Chairs: Giuseppe Bianchi (University of Roma Tor Vergata) and Franco Chiaraluce (Polytechnic University of Marche)

Tuesday September 11, 14.30-16.30  
Room C320

- 14.30-15.00 ***Invited: Blockchain technology beyond cryptocurrencies***  
Ivan Visconti (University of Salerno).
- 15.00-15.15 ***Verification of vehicular mobility through multiple blockchains***  
Michele Macagno, Carla Fabiana Chiasserini, Paolo Giaccone, German Sviridov.
- 15.15-15.30 ***Scholarium: supporting identity claims through a permissioned blockchain***  
George-Andrei Dima, Andrei-Gabriel Jitariu, Claudio Pisa, Giuseppe Bianchi.
- 15.30-15.45 ***Leveraging blockchain to enable smart-health applications***  
Angelo Caposelle, Mauro Conti, Andrea Gaglione, Riccardo Lazzeretti, Paolo Missier, Michele Nati.
- 15.45-16.00 ***BLAsT: blockchain-assisted key transparency for device authentication***  
Alessandro Gattolin, Cristina Rottondi, Giacomo Verticale.
- 16.00-16.15 ***Blockchain technology for financial services facilitation in RES investments***  
Ferdinando Bosco, Vincenzo Croce, Giuseppe Raveduto.
- 16.15-16.30 ***Bitcoin pool-hopping detection***  
Marianna Belotti, Sofiane Kirati, Stefano Secchi.

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## Tutorial Track 2: Additive manufacturing and 3D printing for medicine: experiences and opportunities

F. Auricchio (University of Pavia, Italy)  
Tuesday September 11, 14.30-16.30  
Aula Magna

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## Student Branch and Student Events

Tuesday September 11, 14.30-16.30  
Aula Capitò

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## Coffee break

16.30-17.00

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## Advanced materials for photovoltaic applications

Chairs: Isodiana Crupi – University of Palermo, Antonio Agresti - University of Rome Tor Vergata

Tuesday September 11, 17.00-19.15  
Room C330

- 17.00-17.30 ***Invited: Graphene and related 2D materials: a winning strategy for enhanced efficiency and stability in perovskite photovoltaics***  
Sara Pescetelli (University of Rome Tor Vergata), Antonio Agresti, Yan Busby, Francesco Bonaccorso, Aldo Di Carlo.
- 17.30-18.00 ***Invited: Silicon nanowires obtained by plasma based CVD for application in solar cells***  
Rosaria Puglisi (CNR- IMM – Catania).
- 18.00-18.15 ***A novel class of dye-sensitized solar modules. Glass-plastic structure for mechanically stable devices***  
Paolo Mariani, Luigi Vesce, Aldo Di Carlo.
- 18.15-18.30 ***Structural and optical behaviour of MAPbI<sub>3</sub> layers in nitrogen and humid air***  
Alessandra Alberti, Giovanni Mannino, Ioannis Deretizs, Emanuele Smecca, Salvatore Sanzaro, Antonino La Magna, Youhei Numata, Tsutomu Miyasaka.
- 18.30-18.45 ***Fabrication and characterisation of perovskite thin films for photovoltaic application***  
Claudio Zanca, Carmelo Sunseri, Rosalinda Inguanta.
- 18.45-19.00 ***Conductive free standing polymer paste synthesized by acid induced phase separation***  
Valentina Lombardo, Salvatore Di Franco, Luisa D'Urso, Antonino La Magna, Antonio Terrasi, Rosaria Puglisi.
- 19.00-19.15 ***Impact of the emitter contact pattern in c-Si BC-BJ solar cells by numerical simulations***  
Raffaele De Rose, Noemi Guerra, Marco Guevara, Paul Procel, Marco Lanuzza, Felice Crupi.
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## Computer Vision

Chair: Marco La Cascia (University of Palermo)

Tuesday September 11, 17.00-18.45  
Room C340

- 17.00-17.30 ***Invited: Computer vision in embedded devices***  
Alessandro Capra (STMicroelectronics).
- 17.30-17.45 ***Automated generation of a Single Shot Detector C library from high level deep learning framework***  
Danilo Pietro Pau, Luigi Di Stefano, Luca Ranalli, Emanuele Plebani, Mirko Falchetto, Viviana D'Alto
- 17.45-18.00 ***Performance comparison of methods based on image retrieval and direct regression for egocentric shopping cart localization***  
Emiliano Spera, Antonino Furnari, Sebastiano Battiato, Giovanni Maria Farinella.

- 18.00-18.15 ***Parallelized convolutions for embedded ultra low power deep learning SoC***  
Danilo Pietro Pau, Lorenzo Cunial, Ahmet Erdem, Cristina Silvano, Mirko Falchetto, Andrea Ornstein, Giuseppe Desoli, Emanuele Plebani.
- 18.15-18.30 ***Reducing complexity of 3D indoor object detection***  
Roberta Maisano, Valeria Tomaselli, Alessandro Capra, Francesco Longo, Antonio Puliafito.
- 18.30-18.45 ***Pedestrian tracking in 360 video by virtual PTZ cameras***  
Vito Monteleone, Liliana Lo Presti, Marco La Cascia.

### **Contact Management in connected Society & Enterprises**

Chairs: Marie-Hélène Abel (University of Technology of Compiègne – SMC France Chapter Chair), Hedi Karray (Ecole Nationale d'Ingénieurs de Tarbes)

Tuesday September 11, 17.00-18.45  
Room C320

- 17.00-17.30 ***Invited: Modular ontology overview and usecases. What advantages for the industry?***  
Sylvie Despres (Université Paris Nord)
- 17.30-17.45 ***Using systems of systems to manage enterprise contacts***  
Gregory Wanderley, Marie-Hélène Abel, Emerson Paraiso, Jean-Paul Barthes.
- 17.45-18.00 ***Contact and collaboration context model***  
Siyang LI, Marie-Hélène Abel, Elsa Negre.
- 18.00-18.15 ***Detection of conferences attendees from interactions***  
Nada Matta, Hassan Atifi, Sammy Teffali.
- 18.15-18.30 ***Semantic-enabled contacts as part of an art project management tracking tool***  
Mylène Leitzelman, Nicolas Delaforge.
- 18.30-18.45 ***Augmented documents for research contact management***  
Mickael Coustaty, Nicolas Sidere, Jean-Marc Ogier.

### **Student Branch and Students Events**

Tuesday September 11, 17.00-19.00  
Aula Capitò



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## Wednesday September 12

### Remote sensing models and methods to support sustainable development and disaster management (A)

Chairs: Antonio Iodice – University of Napoli Federico II – GRS South Chapter Chair, Ferdinando Nunziata - University of Napoli Parthenope

Wednesday, September 12, 9.00 – 11.00  
Room C330

- 9.00-9.30     ***Invited: Spaceborne synthetic aperture radars for the next decade***  
Daniele Riccio (Univ. Napoli Federico II)
- 9.30-9.45     ***Multi-polarization method to detect mud flat areas and depolarized targets using spaceborne SAR data***  
Emanuele Ferrentino, Armando Marino, Ferdinando Nunziata, Maurizio Migliaccio, XiaoMing Li.
- 9.45-10.00     ***Rice mapping and sowing date estimation using CSK SAR data***  
Giuseppina Forino, Ferdinando Nunziata, Lucio Mascolo, Giovanni Pugliano, Maurizio Migliaccio.
- 10.00-10.15     ***Analysis of dual-polarimetric radar measurements collected in a controlled environment***  
Angelo Urciuoli, Ferdinando Nunziata, Angelo Gifuni, Maurizio Migliaccio.
- 10.15-10.30     ***Further insights on the co-polarized phase difference over the ocean***  
Carina de Macedo, Andrea Buono, Maurizio Migliaccio.
- 10.30-10.45     ***Multi-frequency and multi-polarization synthetic aperture radar for the Larsen-C A-68 iceberg monitoring***  
Ferdinando Nunziata, Andrea Buono, Miguel Moctezuma, Flavio Parmiggiani, Giuseppe Aulicino, Maurizio Migliaccio.
- 10.45-11.00     ***A web application for the automatic mapping of the flood extent on SAR images***  
Abdelhakim Benoudjit, Raffaella Guida.

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## Nanotechnologies for industry 4.0

Chairs: Roberto Macaluso - University of Palermo, Yogendra Kumar Mishra - Kiel University

Wednesday, September 12, 9.00 – 10.15  
Room C340

- 9.00-9.30     ***Invited: Nanowire technology for sensing applications***  
Alberto Pasquarelli (Ulm University, Germany)
- 9.30-9.45     ***Design of a simple readout circuit for resistive switching memristors based on CMOS inverters***  
Gabriel Andres Sanca, Fabrizio Di Francesco, Natalia Caroli, Mariano Garcia Inza, Federico Golmar.

- 9.45-10.00 ***Chemical bath deposition as a simple way to grow isolated and coalesced ZnO nanorods for light-emitting diodes fabrication***  
Mauro Mosca, Isodiana Crupi, Daniele Carmelo Russotto, Giuseppe Lullo, Roberto Macaluso, Costantino Giuseppe Giaconia, Salvatore Mirabella, Eric Feltin.
- 10.00-10.15 ***Photocatalytic CO<sub>2</sub> valorization by using TiO<sub>2</sub>, ZrO<sub>2</sub> and graphitic based semiconductors***  
Francesca Rita Pomilla, Giuseppe Marci, Raffaele Molinari, Elisa Isabel Garcia Lopez, Leonardo Palmisano.

## 5G, from technology to its enabled applications

Chairs: Fabio Graziosi - University of L'Aquila, Luca Valcarengi - Scuola Superiore Sant'Anna Pisa

Wednesday, September 12, 9.00– 10.45  
Room C320

- 9.00-9.30 ***Invited: EMF exposure evaluations for Future Networks Based on TDD and massive MIMO: new international regulations***  
Samuela Persia, (Fondazione Ugo Bordon, Italy)
- 9.30-9.45 ***Energy savings of sleep modes enabled by 5G software-defined heterogeneous networks***  
Martin Klapez, Carlo Augusto Grazia, Maurizio Casoni.
- 9.45-10.00 ***Italian 5G trials: a vertical view***  
Antonia Napolitano, Francesco Giannone, Federico Civerchia, Koteswararao Kondepu, Gabriele Cecchetti, Anna Lina Ruscelli, Luca Valcarengi, Piero Castoldi.
- 10.00-10.15 ***Network slicing: an overview***  
Antonia Napolitano, Alessio Giorgetti, Koteswararao Kondepu, Luca Valcarengi, Piero Castoldi.
- 10.15-10.30 ***5G Italian MISE Trial: synergies among different actors to create a "5G road" in Italy***  
Gabiella Coluccelli, Vincenzo Loffredo, Luca Monti, Maria Spada, Fabio Franchi, Fabio Graziosi.
- 10.30-10.45 ***5G networks. An overall perspective for the innovation management***  
Francesco Barletta, Fabio Massimiani and Flavio Otello Pierangeli, Maria Spada, Andrea Marotta, Fabio Graziosi.

## Tutorial: Ethical considerations in system design

A.G. Hessami (Vega Systems, UK)

Wednesday, September 12, 9.00 – 11.00  
Aula Magna

## Women In Engineering Event

Wednesday, September 12, 9.00- 11.00  
Aula Capitò

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## Coffee Break

11.00- 11.30

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## Women In Engineering Event

Wednesday, September 12, 11.30- 13.00

Aula Capito

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## Remote sensing models and methods to support sustainable development and disaster management (B)

Chairs: Antonio Iodice -University of Napoli Federico II GRS South Chapter Chair, Ferdinando Nunziata – University of Napoli Parthenope

Wednesday, September 12, 11.30 – 12.15

Room C330

- 11.30-11.45 ***Maritime surveillance using spaceborne GNSS-reflectometry: the role of scattering configuration and receiving polarization channel***  
Alessio Di Simone, Gerardo Di Martino, Antonio Iodice, Daniele Riccio, Giuseppe Ruello, Leonardo Maria Millefiori, Paolo Braca, Peter Willett.
- 11.45-12.00 ***Landslide monitoring using SAR sub-pixel offset tracking***  
Donato Amitrano, Mario Costantini, Domenico Dell'Aglio, Antonio Iodice, Fabio Malvarosa, Federico Minati, Daniele Riccio, Giuseppe Ruello.
- 12.00-12.15 ***SAR and AIS fusion for maritime surveillance***  
Lotfi Achiri, Raffaella Guida, Pasquale Iervolino.
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## Smart communities for resilient and innovative cities

Chairs: Daniele Ronsivalle - University of Palermo, Stefano Epifani - DTI)

Wednesday, September 12.15 -13.00

Room C330

- 12.15-12.45 ***Invited: Open cities: towards a new governance of cities and territory***  
Roberto Lippi (Coordinador para los Países Andinos, Bogotá - Programa de Naciones Unidas para los Asentamientos Humanos, ONU-HABITAT)
- 12.45-13.00 ***Cities and skills for integration: what can urban planning do? Experiences and reflections between public spaces and collective interest for urban and community (smart) resilience***  
Daniele Ronsivalle

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## Nanotechnologies for industry 4.0

Chairs: Roberto Macaluso - University of Palermo, Yogendra Kumar Mishra - Kiel University

Wednesday, September 12, 11.30 – 12.45

Room C340

- 11.30-12.00 ***Invited: Flame based ZnO tetrapod nanomaterials for multifunctional applications***  
Yogendra Kumar Mishra (Kiel University, Germany)
- 12.00-12.15 ***Integration technologies for the assembly of silicon nanowire devices***  
Alberto Pasquarelli, Ardeshir Moeinian, Arezo Behroudj, Madeleine Nilsen, Michael Roos, Ariful Uday, Steffen Strehle.
- 12.15-12.30 ***Nanoscale investigations of the corrosion of metallic artworks by X-ray photoemission spectroscopy***  
Maria Pia Casaletto, Antonella Privitera, Viviana Figa'.
- 12.30-12.45 ***Forming-free and self-rectifying resistive switching effect in Anodic Titanium Dioxide-based memristors***  
Vincenzo Aglieri, Giuseppe Lullo, Mauro Mosca, Roberto Macaluso, Ugo Lo Cicero, Andrea Zaffora, Francesco Di Franco, Monica Santamaria, Luca Razzari.

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## High Integrity and High Accuracy for Intelligent Transportation Systems

Chairs: Claudio Sacchi - University of Trento, Cosimo Stallo – University of Trento

Wednesday, September 12, 11.30 – 13.00

Room C320

- 11.30-12.00 ***Invited: GNSS High precision for anyone: dream or reality?***  
Roberto Capua (SOGEL, Italy)
- 12.00-12.15 ***Extended Kalman Filter (EKF) innovation-based integrity monitoring scheme with C/N0 Weighting***  
Ni Zhu, David Bétaille, Juliette Marais, Marion Berbineau.
- 12.15-12.30 ***An integrity monitoring algorithm for a rail GNSS augmentation network for rail***  
Pietro Salvatori, Cosimo Stallo, Andrea Coluccia, Francesco Rispoli, Alessandro Neri.
- 12.30-12.45 ***A comprehensive framework for next generation of cooperative ITSs***  
Sandro Chiochio, Cosimo Stallo, Arianna Persia, Pietro Salvatori, Maurizio Salvitti, Elena Cinque, Francesco Valentini, Marco Pratesi, Fortunato Santucci, Francesco Rispoli, Alessandro Neri.
- 12.45-13.00 ***Spoofing impact on gnss integrity in the transport context: a tool for the performance analysis***  
Roberto Capua, Cosimo Stallo, Giorgia Olivieri, Luca Gattuso, Marco Giangolini, Pietro Salvatori, Alessandro Neri, Francesco Rispoli.

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**Tutorial: The role of the Competence Center in the Industry 4.0 Plan**  
**F. Dughiero (University of Padova, Italy - SMACT Competence Center of Triveneto)**  
**L. Angrisani (University of Napoli-Federico II, Italy - Italy Competence Center Napoli-Bari)**

Wednesday, September 12, 11.30 – 13.00

Aula Magna

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**Lunch**

13.00-14.00

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**Exhibition Time**

14.00-14.30

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**Special Meeting on Innovative Start Up & Entrepreneurs**

Wednesday, September 12, 14.30-16.15

Aula Magna

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**Coffee Break**

16.15- 16.45

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**Special Meeting on Innovative Start Up & Entrepreneurs**

Wednesday, September 12, 16.45-19.00

Aula Magna

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**Social Dinner and Award Ceremony**

**“Palazzo Fatta” Piazza Marina Palermo**

20:00-23:00

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## Thursday September 13

### Sustainable marine transportation

Chair: Mirko Marracci - University of Pisa

Thursday, September 13, 9.00- 10.30  
Room C330

- 9.00-9.30 ***Invited: Modern marine transportation systems: safety, security and environmental aspects***  
Bruno Tevené (Chief Technology Office - Underwater Systems, Leonardo Defence Systems).
- 9.30-9.45 ***Measuring UHF-RFID tag position via unmanned aerial vehicle in outdoor scenario***  
Alice Buffi, Bernardo Tellini.
- 9.45-10.00 ***Ageing characterization of Li-Ion batteries discharged at high pulse current rates***  
Mirko Marracci, Bernardo Tellini.
- 10.00-10.15 ***PROT-ONE: better batteries for sustainable marine transportation***  
Mirko Marracci, Bernardo Tellini, Bruno Tevené, Giacomo Paoli.
- 10.15-10.30 ***Wireless charging for marine application***  
Mirko Marracci, Bernardo Tellini, Massimo Macucci, Paolo Marconcini, Edoardo Paglialunga.
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### Compliant non-destructive testing

Chairs: Giovanni Mazzanti -University of Bologna, Pietro Romano - University of Palermo

Thursday September 13 9.00- 10.30  
Room C340

- 9.00-9.30 ***Invited: Use of non-disruptive electrical tests for selection and characterization of materials for EHV cables***  
Luca De Rai (Prysmian Group)
- 9.30-9.45 ***Partial discharges diagnostics along medium voltage cables***  
Pietro Romano, Antonino Imburgia, Luca De Rai.
- 9.45-10.00 ***Detection of partial discharges at square shaped voltages***  
Pietro Romano, Antonino Imburgia, Thomas Hammarstroem.
- 10.00-10.15 ***Effect of acoustic wave reflections on space charge measurements with PEA method***  
Pietro Romano, Antonino Imburgia, Guido Ala, Eleonora Riva Sanseverino, Fabio Viola.
- 10.15-10.30 ***Unmanned aerial vehicle-based non destructive diagnostics***  
Silvano Vergura, Francescomaria Marino, Pietro Romano.

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## Safety Security and Privacy for Cyber-Physical Systems

Chairs: Pierluigi Gallo, University of Palermo, Sara Foresti – University of Milano, Computer Chapter Chair

Thursday, September 13, 9.00- 10.30  
Room C320

- 9.00-9.30 ***Invited: Building trusted and reliable services over cyber- physical systems***  
Franco Davoli
- 9.30-9.45 ***DeCyMo: decentralized cyber-physical system for monitoring and controlling industries and homes***  
Pierluigi Gallo, Quoc Uy Nguyen, Giorgia Barone, Phan Hien.
- 9.45-10.00 ***A novel architecture for cyber-physical security in industrial control networks***  
Giuseppe Bernieri, Mauro Conti, Federica Pascucci.
- 10.00-10.15 ***LoRa signals classification through a CS-based method***  
Leopoldo Angrisani, Mauro D'Arco, Crescenzo Dassi, Annalisa Liccardo.
- 10.15-10.30 ***e-Fairs: a cyber-physical system for aggregation and economy of scale in e-commerce***  
Pierluigi Gallo, Ignazio Gallo.
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### Tutorial Track 3: Machine-Type Communications (MTC) in 5G: challenges, algorithmic design and performance analysis

M. Assaad (Centrale Supélec, France)

Thursday, September 13, 9.00- 10.30  
Aula Magna

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### Coffee Break

10.30- 11.00

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### Panel 3

#### “ICT at the service of the citizen: best practices and business cases”

Chairs: Dajana Cassioli and Fabrizio Granelli

Thursday, September 13, 11.00-13.00  
Aula Magna

***PUSH: innovation through design***  
Domenico SCHILLACI, PUSH

***Trento Smart City***  
Giacomo FIORONI, Municipality of Trento

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***Arianna project***

Daniele CROCE, In.sight

***Wher - maps and cities for women***

Eleonora GARGIULO, W-her

***INCIPICT – Innovation city planning through information & communications technologies***

Fabio GRAZIOSI, University of L'Aquila

***Open Discussion***

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**Lunch**

13.00-14.00

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**Environmental monitoring and prediction**

Chairs: Angelo Genovese- University of Milano, Renè Garelo - IMT Atlantique

Thursday, September 13, 14.00-15.45

Room C330

- 14.00-14.30 ***Invited: Extracting information from a neural network: from statistics to physical processes. application in hydro(géo)logy***  
Anne Johannet (IMT Mines d'Alès, Université de Montpellier, France)
- 14.30-14.45 ***Photometric and fluorimetric data for pollution monitoring in river waters***  
Ekaterina A. Bondarenko, Anastasiya Mikhailova, Julia Lednova, Maria Andrianova.
- 14.45-15.00 ***Improvement of a predictive data-driven model for rainfall-runoff global characterization of Aa river***  
Baya Hadid, Eric Duviella, Stéphane Lecoeuche.
- 15.00-15.15 ***Estimating missing information by cluster analysis and normalized convolution***  
Davide Andrea Guastella, Cesare Valenti.
- 15.15-15.30 ***Towards the prediction of renewable energy unbalance in smart grids***  
Ruggero Donida Labati, Angelo Genovese, Vincenzo Piuri, Fabio Scotti.
- 15.30-15.45 ***Preliminary monitoring and route location of macro energetic project - Nord Stream 2 marine gas pipeline***  
Alexander Chusov, Julia Lednova, Mikhail Shilin, Vladimir Zhigulsky, Alexandra Ershova.
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## Smart technologies and modelling for avionics

Chairs: Alberto Milazzo - University of Palermo, Antonio Faba - University of Perugia

Thursday, September 13, 14.00-16.15  
Room C340

- 14.00-14.30 ***Invited: Resonant circuits for wireless power transfer and possible application to avionics***  
Alberto Reatti (University of Firenze, Italy)
- 14.30-14.45 ***Design and assessment of optimized EMI filters for avionic applications***  
Graziella Giglia, Guido Ala, Leonardo Mistretta, Costantino Giuseppe Giaconia, Simone Quondam Antonio, Hari Rimal.
- 14.45-15.00 ***Design centering of wireless power transfer systems for avionics***  
Alberto Reatti, Fabio Corti, Simone Quondam Antonio, Hari Rimal.
- 15.00-15.15 ***Cockpit pilot warning system: a preliminary study***  
Calogero Orlando, Andrea Alaimo, Antonio Esposito.
- 15.15-15.30 ***Dynamic model of soft ferrites for avionic applications***  
Hari Rimal
- 15.30-15.45 ***GNSS and GALILEO for Cis-lunar and Moon Navigation***  
Gabriele Impresario, Giuseppe D'Amore, Cosimo Stallo, Luigi Ansalone and Alberto Tuoizzi.
- 15.45-16.00 ***Power losses in ferromagnetic steel sheets for avionic environment***  
Simone Quondam Antonio, Hari Rimal.
- 16.00-16.15 ***Exploiting fog as a service model for designing specialized airport information systems***  
Fahad Masood Siddiqui
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## Telemedicine and e-Health: medical image data and datasets into healthcare interoperability with IoT

Chairs: Giuseppe Caruso - University of Palermo, Luigi Rovati - University of Modena and Reggio Emilia

Thursday, September 13, 14.00-15.15  
Room C320

- 14.00-14.15 ***Towards an electronic medical record for precision oncology: information and knowledge management***  
Norbert Maggi, Carmelina Ruggiero, Mauro Giacomini.
- 14.15-14.30 ***Spectral repeatability of a hyperspectral system for human iris imaging***  
Luca Di Cecilia, Francesco Marazzi, Luigi Rovati.
- 14.30-14.45 ***Implementation of an Iot node for biomedical applications***  
Sofia Bonfanti, Giulia Crocioni, Francesca Cunsolo, Giambattista Gruosso.
- 14.45-15.00 ***An algorithm for estimating gait parameters through a commercial sensorized carpet*** Riccardo Bagarotti, Elisa M Zini, Elisa Salvi, Lucia Sacchi, Silvana Quaglini, Giordano Lanzola.

- 15.00-15.15 ***Automating lung cancer identification in pet/ct imaging***  
Eleonora D'Arnese, Emanuele Del Sozzo, Arturo Chiti, Tanya Berger-Wolf, Marco D. Santambrogio.
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### **Distributed ICT for health and wellness**

Chairs: Fernanda Irrera University of Roma La Sapienza, ED Chapter Chair, Maria-Alexandra Paun IEEE Switzerland Chair

Thursday, September 13, 15.15-16.00  
Room C320

- 15.15-15.45 ***Invited: Smart devices for health and AAL in the new concept of smart living***  
Pietro Siciliano (IMM-CNR Lecce, Italy)

- 15.45-16.00 ***A computer vision algorithm for the estimation of the human hair diameter***  
Gabriele Maroni, Valerio Uberti, Simone Facheris, Fabio Previdi.
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### **Closing Session**

Thursday, September 13, 16.15-16.45  
Aula Magna

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### **Italy Section Exco**

Thursday, September 13, 16.45-18.45

Room C310

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