The 11th EAI International Conference on Body Area Networks

&

MOBILe Wireless MiddleWARE, Operating Systems, and Applications

INTERNET OF THINGS

SMART CITIES

E-HEALTH

DECEMBER 15–16, 2016
TURIN, ITALY

APPLICATIONS FOR FUTURE INTERNET

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GENERAL CHAIRS

On behalf of the Steering Committee, of the Organizing Committee and of the Scientific Committee, we are glad to welcome all participants to the 11th edition of BodyNets, Body Are Networks, conference that will be held in conjunction with 7th International Conference on MOBILe Wireless MiddleWARE, Operating Systems, and Applications (Mobilware 2016). Both conferences are endorsed by the European Alliance for Innovation, a leading community-based organization devoted to the advancement of innovation in the field of ICT.

The novel requirements of the healthcare sector, facing - among other issues - the strong demographic changes associated with aging population in almost all developed countries, put researchers in front of new and exciting challenges. Advanced electronic and networked systems allowing real-time monitoring can strongly reduce medication time and costs. Timely intervention of physicians on individuals living alone (whose numbers are constantly increasing), or in remote areas, is possible if appropriate data transmission infrastructure is guaranteed. One part of this complex architecture is the so-called Body Area Networks (BAN) technology, i.e. the part of the communication infrastructure that directly interacts with the human body. It should be able to support both the sensing part, connected to the relative data transmission from the person under inspection to the physician, and the possibility to receive notifications and/or alerts once the data have been processed. Such technologies are already starting to enter into routine clinical practice. However, novel technologies such as nano-communication, intra/extra body communication, and others open the door for more and more accurate future diagnostics. Today, research activity is strongly driven by non-invasive exploration of living bodies. Wide-band reflectometry using adequate antennas system represents a possible way, but sometimes more accuracy is required, which can be achieved by the use of implantable sensors that can closely investigate the interested tissues and are able to communicate with the external systems. For some applications, this communication can be unidirectional for monitoring purposes, but even in these cases, the transceiver should be carefully designed to obtain the necessary data while generating as low as possible radiofrequency power within the tissues. The received signal is processed locally or sent to a remote medical center for further processing. The algorithms to extract the information are quite complex, and the low signal-to-noise ratio makes the analysis even more challenging. A bi-directional communication on the other hand represents a considerable advancement, when the sensor nodes are remotely controlled based on the feedback of the received data, for controlled drug release applications, as an example. Nevertheless, the reduced transmitter-receiver distance and the presence of different high-loss tissues introduce strong reflections.

GENERAL CHAIRS

In this context, BodyNets has a wide scope, which in its 7 sessions – including 4 Special Tracks organized by renowned experts in their field - and two keynotes includes all kinds of advanced applications in the field of Body Area networks. The invited paper and the Special Track organized within a European project demonstrates the huge interest on the research topics covered by this conference. Broad areas are enclosed, ranging from "Cloud-assisted Body Area Networks", to "Sensors and Algorithms for Human Motion Analysis and Classification" going through the interdisciplinary of the topic within the "Body Area NanoNETworks: Electromagnetic, Materials and Communications".

The biggest challenge is to put together research outputs from such different fields, in order to create new devices with high added-value contents that can be efficiently used also by people facing disabilities, with the intention of improving the quality of their lives.

The two Conferences are held at the Turin Palace Hotel in Torino. The hotel is just across the street from Torino's main Railway station, Porta Nuova. The last station of direct busses to/from the airport is just 2 minutes walk away. At walking distance in Torino downtown you can find important historical monuments, museums and parks. The Gala dinner on Thursday will take place at the "La Smarrita" restaurant that recalls the regal fashion of Italy's first capital town.

Do not miss the opportunity to visit so many interesting places in Torino and its surroundings: We are sure you will enjoy them.

Prof. Ladislau Matekovits
Politecnico di Torino, Italy
General Chair, Bodynets 2016
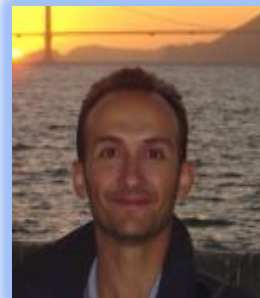
Prof. Giancarlo Fortino
University of Calabria, Italy
General Co-Chair, Bodynets 2016

GENERAL CHAIRS

Welcome to the 7th International Conference on MOBILe Wireless MiddleWARE, Operating Systems, and Applications (Mobilware 2016)

The recent advances in wireless communications and the proliferation of powerful mobile devices have enabled smart cyber-physical environments where people and devices can seamlessly interact and where mass-market users are willing to receive/contribute to a wide range of mobile services, everywhere and anytime. A key enabler of these pervasive ubiquitous environments is the advancement of software and middleware technologies in various mobile-related sectors, ranging from effective synergic management of wireless communications to mobility/adaptivity support in operating systems, from horizontal support to crowdsourcing in different application domains to dynamic offloading to cloud resources, only to mention a few.

Within this perspective, this conference aims at attracting relevant international contributors who are actively working in the areas (not exhaustive list) of novel middleware concepts and solutions for mobile devices, mobile middleware enabling machine-to-machine communications, mobile crowdsourcing and people-centric collaborative sensing, as well as middleware for mobile cloud computing (e.g., seamless offloading) and big data scalable processing of mobile sensors-generated datastreams. In addition, the conference is highly open to contributions at the application level as well as in terms of large experimentations and wide-scale deployments, e.g., in the domains of smart space/city applications, wireless sensor networks, vehicular networks, and home networks. Moreover, we have observed emerging and growing interest (as demonstrated also by the received submissions) in emerging topics associated with the opportunity of virtualizing support functions for 5G mobile services, e.g., in terms of impact of IMS, RCS, RCS-e, EPC and LTE on the evolution of mobile middleware.

Given the above scope of primary interests and foci, Mobilware's main objective is to attract presentations by both researchers and practitioners of their recent results, findings, and achievements in all related components, including the advancement of middleware technologies in various mobile-related sectors, ranging from effective synergic management of wireless communications to dynamic adaptiveness of system software, and from horizontal support of crowdsourcing in different application domains to dynamic offloading on cloud resources. By fostering innovation, one of the central goals of Mobilware is to advance the understanding of and addressing the technical challenges in mobile communications regarding current and future mobile services, applications, and devices for wearable and ubiquitous computing.

GENERAL CHAIRS

This 7th edition of Mobilware has the honor of having a compact but very interesting technical program consisting of two prestigious keynote speeches and 7 full papers accepted from open call (acceptance rate = 55%), covering several aspects of the above sketched mobile middleware landscape. We are happy to have invited renowned researchers to serve on the program committee, providing comprehensive reviews to the submissions. In particular, each individual submission underwent a rigorous review process assisted by program committee members, with each paper that has received at least three reviews.

We would like to express our deepest gratitude to the program committee members for their dedication to the high quality review process, within a relatively short review cycle. This conference would not have been possible without their support and hard work. We are glad to acknowledge the highly diversified representation of the program committee, with members coming from many different countries over five continents. Besides, we would like to thank the external reviewers enlisted by the program committee members to complete the expert review within an even shorter time period. We would like to take this opportunity to thank the authors, who submitted their valuable research results to the conference, and the attendees participating in the sessions sharing research ideas and working on establishing new long-term relationships and collaborations.

We deeply appreciate the invaluable help of the Steering Committee members, providing assistance and valuable suggestions based on the experience of past editions and on Mobilware history. Last but not least, we would like to thank the EAI Staff and the local arrangement team for their tremendous efforts to ensure of a smooth organization and running of the conference.

Together, we enjoy a memorable event here in Turin, in conjunction with the companion and very promising EAI BodyNets event.

 (on behalf of the whole Mobilware 2016 Organizing Committee)

General Co-Chairs:
Paolo Bellavista, University of Bologna, Italy
Jian-Nong Cao, Hong Kong Polytechnic University, Hong Kong

Technical Program Co-Chairs:
Markus Endler, PUC, Rio de Janeiro, Brazil
Uichin Lee, KAIST, Korea

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Athanasios V. Vasilakos
Lulea University of Technology,
Sweden

ABSTRACT

The ability of engineered biological nanomachines to communicate with biological systems at the molecular level is anticipated to enable future applications such as monitoring the condition of a human body, regenerating biological tissues and organs, targeted drug delivery, interfacing artificial devices with neural systems and it can serve as countermeasure for surveillance (security) against nuclear, biological and chemical attacks. From the viewpoint of communication theory and engineering, molecular communication is proposed as a new paradigm for engineered biological nanomachines to communicate with the natural biological nanomachines which form a biological system. Distinct from the current telecommunication paradigm, molecular communication uses molecules as the carriers of information; sender biological nanomachines encode information on molecules and release the molecules in the environment, the molecules then propagate in the environment to receiver biological nanomachines, and the receiver biological nanomachines biochemically react with the molecules to decode information. Current molecular communication research is limited to small-scale networks of several biological nanomachines. Key challenges to bridge the gap between current research and practical applications include developing robust and scalable techniques to create a functional network from a large number of biological nanomachines. Developing networking mechanisms and communication protocols is anticipated to introduce new avenues into integrating engineered and natural biological nanomachines into a single networked system (Internet of Bio-Nano Things).

Athanasios V. Vasilakos
Lulea University of Technology,
Sweden

BIO

Athanasios V. Vasilakos is currently Full Professor at Lulea University of Technology (Sweden) in the Department of Computer Science. He has authored or co-authored over 250 technical papers in major international journals and conferences. He is author/coauthor of five books and 20 book chapters. His main research topics include: Networks, Sensor nets/IoTs, Cloud Computing, Green Networking, Algorithms, Security & Privacy, Big Data, Body Area Network (BANs), Medical Informatics, Molecular Nano-Networks. He is an ISI Highly cited researcher, with 13600 citations, h-index= 70 and with 36 works with more than 100 citations each. Prof. Vasilakos has served as General Chair, Technical Program Committee Chair for many international conferences and he is serving/ has served as an Editor for many leading journals, such as IEEE Transactions on Information Technology in Biomedicine (2009-2012), IEEE Transactions on Network and Services Management (2011-2014), IEEE Transactions on Cloud Computing (Today), IEEE Transactions on Information Forensics and Security (Today), IEEE Transactions on Cybernetics (Today) and IEEE Transactions on Nanobioscience (Today).

SUSTAINABLE SMART WEARABLES: TOWARD SENSOR ANALYTICS WITH HARVESTED ENERGY

Luca Benini
University of Bologna, Italy

ABSTRACT

Wearables devices are becoming ubiquitous in our lives, replacing classically passive artifacts like bracelets, shoes, clothes. These sensor-rich connected devices are going to produce a mind-boggling quantity of data and potentially useful information. However, data alone do not provide value unless we can turn them into actionable, contextualized information. Sensor Data Analytics (SDA) allows us to gain new insights through batch-processing off-line analysis of raw sensor data, but in order to make it scalable and effective for the user, we should make a big part of the SDA pipeline real-time and near-sensor. Current wearable devices perform only very limited filtering, feature extraction and classification on-board and usually leverage smart-phones for computationally intensive tasks. Even with this limited local intelligence approach, current wearables are battery-limited and need frequent recharges.

In this talk I will present our experience in building smart wearable devices that processes the data fully, in situ, with a power draw compatible with wrist-wearable energy harvesters. This approach significantly reduces the amount of data to be transmitted and the required human intervention, including battery recharging. I will describe the main technological building blocks, our system integration efforts, the application challenges emerging from our field trials and provide insights on future research directions.

Luca Benini
University of Bologna, Italy

BIO

Luca Benini is the chair of digital Circuits and systems at ETHZ and a professor at University of Bologna.

He received a Ph.D. degree in electrical engineering from Stanford University in 1997. Dr. Benini's research interests are in energy-efficient system design and Multi-Core SoC design. He is also active in the area of energy-efficient smart sensors and sensor networks for biomedical and ambient intelligence applications.

He has published more than 700 papers in peer-reviewed international journals and conferences, 4 books and several book chapters. He is a Fellow of the IEEE and a member of the Academia Europaea.

Assaf Schuster
Computer Science Department
Technion - Israel Institute of Technology

ABSTRACT

More and more tasks require efficient processing of continuous queries over scalable, distributed data streams. Examples include monitoring over battery-operated IOT and smart systems, optimizing systems using their operational log history, mining sentiments using sets systems of crawlers, and data fusion over heterogeneous sensor networks.

However, distributed mining and/or monitoring of global behaviors can be prohibitively difficult. The naïve solution which sends all data to a central location mandates extremely high communication volume, thus incurring unbearable overheads in terms of resources and energy. Furthermore, such solutions require expensive powerful central platform, while data transmission may violate privacy rules.

An attempt to enhance the naïve solution by periodically polling aggregates is bound to fail, exposing a vicious trade-off between communication and latency. Given a continuous global query, the solution proposed in the talk is to generate filters, called safe zones, to be applied locally at each data stream. Essentially, the safe zones represent geometric constraints which, until violated by at least one of the sources, guarantee that a global property holds. In other words, the safe zones allow for constructive quiescence:

There is no need for any of the data sources to transmit anything as long as all constraints are held with the local data confined to the local safe zone. The typically-rare violations are handled immediately, thus the latency for discovering global conditions is negligible. The safe zones approach makes the overall system implementation, as well as its operation, much simpler and cheaper. The saving, in terms of communication volume, can reach many orders of magnitude. The talk will describe a general approach for compiling efficient safe zones for many tasks and system configurations.

Prof.Assaf Schuster
Computer Science Department
Technion - Israel Institute of Technology

BIO

Professor Assaf Schuster of the Computer Science Department at the Technion is an ACM fellow and a world leading expert of distributed and scalable data Mining, Big Data technologies analytics & prediction, Cyber security and system vulnerabilities, privacy preserving, cloud resource management and more.

Prof. Schuster published more than 200 papers in highly selective conferences and journals, some of which won prestigious awards. He consulted leading hi-tech companies and participated in the bumpy journey of quite a few startups, some of which were successful. His research group is well known for its contributions to the field of big data and scalable, real-time knowledge discovery in distributed data streams.

Franco Zambonelli
University of Modena and Reggio Emilia, Italy

ABSTRACT

Most of the emerging scenarios in the area of pervasive computing and smart cities involve a very large number of interacting autonomous mobile components. In my talk, I argue that the peculiar features of such emerging socio-technical systems (up to millions of interacting components, geographically-distributed over vast areas, mixing humans and artificial components, and lacking any form of central control) call for radically novel approaches and middleware infrastructures to coordinate their overall activities and functionalities. In this context, I will overview some representative scenarios of emerging large-scale urban systems, with a particular attention to scenarios related to the coordination of mobility patterns. Following, I will discuss the key challenges to be faced by research in coordination models and middleware infrastructures, and eventually sketch some promising research directions.

BIO

Franco Zambonelli is full professor of Computer Science at the University of Modena and Reggio Emilia. He got his PhD in Computer Science and Engineering from the University of Bologna in 1997. His research interests include: pervasive computing, multi-agent systems, self-adaptive and self-organizing systems. He has published over 90 papers in peer-reviews journals, and has been invited speaker at many conferences and workshops. He is the co-Editor in Chief of the ACM Transactions on Autonomous and Adaptive Systems, and he is in the Editorial Board of the Elsevier Journal of Pervasive and Mobile Computing, of the BCS Computer Journal and of the Journal of Agent-Oriented Software Engineering, and he is in the Steering Committee of the IEEE SASO Conference. He has been scientific manager of the EU FP6 Project CASCADAS and coordinator of the EU FP7 Project SAPERE. He is ACM Distinguished Scientist, member of the Academia Europaea, and IEEE Fellow.

PROGRAM
OVERVIEW

DAY 1 – THURSDAY, 15 DEC. 2016

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8:30 – 9:00	REGISTRATION
9:00 – 9:15	WELCOME MESSAGE
9:20 – 10:00	KEYNOTE 1
10:00 – 10:40	KEYNOTE 2
10:40 – 11:00	MORNING TEA

Time	ROOM 1	ROOM 2
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12:30 – 14:00	LUNCH BREAK	
14:00 – 15:40	SESSION TH. P. 1.1	SESSION TH. P. 1.2
15:40 – 16:00	AFTERNOON TEA	
16:00 – 18:00	SESSION TH. P. 2.1	SESSION TH. P. 2.2
19:30	GALA DINNER	

PROGRAM OVERVIEW

DAY 2 – FRIDAY, 16 DEC. 2016

Time	Event
8:30 – 9:00	REGISTRATION
9:00 – 9:15	WELCOME MESSAGE
9:15 – 10:15	KEYNOTE
10:15 – 10:40	MORNING TEA

Time	ROOM 1	ROOM 2
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12:30 – 14:00	LUNCH BREAK	
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16:20 – 16:30		CLOSING REMARKS – MOBILWARE

8:30 – 9:00	REGISTRATION	
9:00 – 9:15	OPENING SESSION *Bodynets*	Room 1
9:20 – 10:00	KEYNOTE SPEECH *Bodynets*	Room 1

THE BIOLOGICAL INTERNET
Athanasios V. Vasilakos, Lulea University of Technology, Sweden

10:00 – 10:40	KEYNOTE SPEECH *Bodynets*	Room 1

SUSTAINABLE SMART WEARABLES: TOWARD SENSOR ANALYTICS

WITH HARVESTED ENERGY

Luca Benini, University of Bologna, Italy

10:40 –11:00	MORNING TEA	

11:00 –12:20	**Session Th. A. 1.1 Special Track: (ST1) Antenna/Propagation and WiBEC Project (APWiBEC)**	Room 1

Organized by:
Dirk Plettemeier (Technische Universität Dresden, Germany)
Qiong Wang (Technische Universität Dresden, Germany)
Chairs:
Wang Qiong (Dresden University of Technology, Germany)

- **Impedance Characteristics and Field Separation of Body Implanted Antennas,**
  Wang Qiong, Fang Xiao, Plettemeier Dirk (Dresden University of Technology, Germany)
- **Characteristics Comparison of Three Different WCE Implanted Antennas in UWB Low Band,** Wang Qiong, Plettemeier Dirk (Dresden University of Technology), Andreu Carlos, García-Pardo Concepcion, Cardona Narcis (Universitat Politècnica de València, Spain)

- **Grating Lobes Suppression of Sparse Linear Phased Arrays Using Generic Algorithms,** Chen Chen, Miao Jungang, Yin Fenglin (Beihang University, China)
- **Antenna Radiation Efficiency Considerations in Body Area Networks,**Sarrazin, Julien, Valerio Guido, Razafimahatratra Solofo, Casaletti Massimiliano (UPMC University (L2E), France), Sarrazin François (UPEMLV University (ESYCOM), France), Petrillo Luca, De Doncker Philippe (ULB University (OPERA), France), Benlarbi-Delai Aziz (UPMC University (L2E), France)

11:00 –12:20 Session Th. A. 1.2   Room 2
Special Track: (ST3)
Cloud-assisted Body Area Networks (CBAN)

Organized by:
Raffaele Gravina (University of Calabria, Italy)
Giancarlo Fortino (University of Calabria, Italy)
Mohammad Mehedi Hassan (King Saud University, Saudi Arabia)
Chairs:
Raffaele Gravina (University of Calabria, Italy)
Giancarlo Fortino (University of Calabria, Italy)

- **Resource allocation for IoT devices in cloud to Support Pervasive Healthcare Domain,** Albakr Hanoufsaad, Hassan Mohammad Mehedi, Aldossary Hmood (King Saud University, Saudi Arabia)
- **A Robust Distributed Remote Health Monitoring System for Rural Area with Limited Internet Access**, Pourhomayoun Mohammad (UCLA), Dabiri Foad (WANDA Inc), Sideris Costas, Yadav Kartik (UCLA), Tseng, Linda (Google), Alshurafa Nabil (Northwestern University), Ghasemzadeh Hassan (Washington State University), Nyamathi Adeline, Sarrafzadeh, Majid (UCLA)
- **Towards Interoperability of IoT-based Health Care platforms: the INTER-Health use case,** Pace Pasquale, Aloi Gianluca, Gravina, Raffaele, Fortino Giancarlo (University of Calabria, Italy), Larini Giovanna (TIM - Telecom Italia), Gulino Margherita (Azienda Sanitaria Locale TO5, Italy)
- **A Hybrid Localization Algorithm for Wearable Safety Devices,** Sottile Francesco, Tovar Ordoñez Orlando, Kallias Emil, Pastrone Claudio (ISMB, Torino, Italy)

12:30 – 14:00   LUNCH

14:00 –15:40 Session Th. P. 1.1
Special Track: (ST7)
Sensors and Algorithms for Human Motion Analysis and Classification (SAHM)

Organized by:
Angelo Maria Sabatini (Scuola Superiore Sant'Anna, Italy)
Rezaul Begg (Victoria University, Melbourne, Australia)
Chairs:
Angelo Maria Sabatini (Scuola Superiore Sant'Anna, Italy)
Rezaul Begg (Victoria University, Melbourne, Australia)

- **Designing a Wearable Multi-sensor System for Smart Eating Detection,** Cohen Eli, Stogin William (Northwestern University), Kalantarian Haik (UCLA), Alshurafa Nabil (Northwestern University)
- **Networked Human Motion Capture System Based on Quaternion Navigation,** Jie Li, Zhe-long Wang, Hongyu Zhao, (Dalian University of Technology, China), Raffaele Gravina, Giancarlo Fortino, (University of Calabria, Rende, Italy)
- **The identification of multiple U-turns in gait: comparison of four trunk IMU-based methods,** Bertoli Matilde (Università di Sassari, Italy), Cereatti Andrea (Politecnico di Torino, Italy), Trojaniello Diana (San Raffaele Scientific Institute, Italy), Ravaschio Andrea (Università di Genova, Italy), Della Croce Ugo (Università di Sassari, Italy)
- **Step counting for slow and intermittent ambulation based on a smartwatch accelerometer,** Genovese, Vincenzo, Mannini, Andrea, Sabatini, Angelo Maria (The BioRobotics Institute, Scuola Superiore Sant'Anna)
- **Impact of Random Body Movements on 60-GHz Doppler Radar for Real-Time Monitoring of Vital Signs,** Valerio Guido, Zhang Ting, Sarrazin Julien (Sorbonne Universités, UPMC Univ Paris 06, France), Istrate, Dan (Université de Technologie de Compiègne, France)

14:00 –15:40 Session Th. P. 1.2 Special Track: (ST2)
Body Area NanoNETworks: Electromagnetic, Materials and Communications (BANN-EMC)

Room 2

Organized by:
Valeria Loscri (INRIA Lille-Nord Europe, France) Anna Maria Vegni (University of Roma Tre, Italy) Ildiko Peter (Politecnico di Torino, Italy) Ladislau Matekovits (Politecnico di Torino, Italy)
Chairs:
Luca Felicetti (University of Perugia, CNIT RU, Italy)

- **Congestion Control for Biological Nanoscale Cyber-Physical Systems, (Invited),** Luca Felicetti, Mauro Femminella, Gianluca Reali, (University of Perugia, CNIT RU, Italy)
- **Recent Advances in Body Area NanoNetworks: Electromagnetic, Materials and Communications,** Loscri Valeria (Inria Lille - Nord Europe, FUN Team), Ladislau Matekovits, Ildiko Peter (Politecnico di Torino, Italy), Anna Maria Vegni (Roma Tre University, Italy)
- **Precise Detection and Treatment of Human Diseases Based on Nano Networking,** Stelzner Marc, Lau Florian-Lennert (University of Lübeck, Germany), Freundt Katja (Research Center Borstel, Germany), Büther Florian, Nguyen Mai Linh (University of Lübeck, Germany), Stamme Cordula (Research Center Borstel, University of Lübeck, Germany), Ebers Sebastian (University of Lübeck, Germany)
- **Study of oxide coated Mg-based bio-substrate for therapeutic purpose,** Éva Fazakas (Bay Zoltan Research Institute, Budapest, Hungary), Ildiko Peter, (Politecnico di Torino, Italy)
- **Reduction of the mutual coupling between implanted microstrip antennas on a cylindrical biocompatible metallic ground plane,** Jie Huang, Ildiko Peter, Ladislau Matekovits (Politecnico di Torino, Italy)

15:40 – 16:00 AFTERNOON TEA

16:00 –18:00 Session Th. P. 2.1 Motion recognition

Room 1

- **A baseline walking dataset exploiting accelerometer and gyroscope for fall prediction and prevention systems,** Hemmatpour Masoud, Ferrero Renato, Montrucchio Bartolomeo, Rebaudengo Maurizio (Politecnico di Torino, Italy)
- **Eigenwalk: a Novel Feature for Walk Classification and Fall Prediction,** Hemmatpour Masoud, Ferrero Renato, Montrucchio Bartolomeo, Rebaudengo Maurizio (Politecnico di Torino, Italy)
- **Food Watch: Detecting and Characterizing Eating Episodes through Feeding Gestures,** Zhang Shibo, Alharbi Rawan, Pourhomayoun Mohmmad (UCLA, USA), Alshurafa Nabil (Northwestern University, USA)
- **From Activity Recognition to Motion Assessment: Delimitate against the Other Class within a WBAN,** Seiffert Martin (Freie Universität Berlin, Germany), Holstein Flavio (Technical University of Berlin, Germany), Schiller Jochen (Freie Universität Berlin, Germany)
- **Activity Level Assessment of Wheelchair Users Using Smart Cushion,** Ma Congcong (Wuhan University of Technology, China), Gravina Raffaele (University of Calabria, Italy), Li Wenfeng, Zhang Yu (Wuhan University of Technology, China), Li Qimeng,   Fortino Giancarlo (University of Calabria, Italy)
- **Secure Monitoring of the Patients with Wandering Behaviour,** Tupakula Udaya, Varadharajan Vijay, Karmakar Kallol (Macquarie University, Sydney, Australia)

16:00 –18:00 Session Th. P. 2.2 Modelling
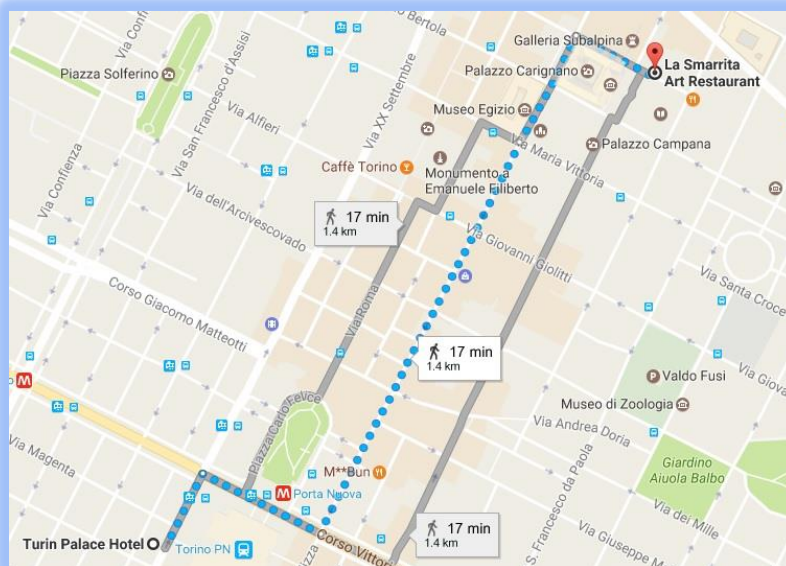
Room 2

- **Analytical Modelling of Near-Field Coupling Communication between Persons Equipped with Wearable Terminals through Handshaking,** Takeuchi Ryo, Hasegawa Shin, Kado Yuichi (Kyoto Institute of Technology, Japan), Ayuzawa, Shinagawa Mitsuru (Hosei University, Japan), Ohashi Kyoji, Saito Daisuke (Nippon Signal Company, Japan)
- **Fitness Trackers and Wearable Devices: how to Prevent Inference Risks?** Torre Ilaria, Koceva Frosina, Sanchez Odnan Ref, Adorni Giovanni   (University of Genova, Italy)

- **Design and Calibration of a 60-GHz Personal Exposimeter for Exposure Assessment in Specular and Diffuse Environments,** Aminzadeh Rezak, Thielens Arno(Ghent University/iMinds, Belgium), Khadir Fall Abdou (Institute of Electronics and Telecommunications of Rennes (IETR), INSA, France), Li Haolin (Ghent University/iMinds, Belgium), Leduc Carole, Zhadobov Maxim (Institute of Electronics and Telecommunications of Rennes (IETR), France), Torfs Guy, Bauwelinck Johan, Martens Luc, Joseph Wout (Ghent University/iMinds, Belgium)
- **On the Optimum Data Carrier for Intra-body Communication Applications,** Khorshid Ahmed E., Eltawil Ahmed M., Kurdahi Fadi (UCI, USA)
- **ST 8: Optimum Receiver Location for Ultra Wideband In-Body Communication Based on Channel Capacity Calculation,**Brumm Jan-Christoph, Bauch Gerhard (Hamburg University of Technology, Germany)
- **Evaluating Human Activity-Based Ambient Lighting Displays for Effective Peripheral Communication,** Davis Kadian, Owusu Evans (Independent Researcher), Marcenaro Lucio (University of Genova, Italy), Hu Jun (Eindhoven University of Technology, The Netherlands), Regazzoni Carlo (University of Genova, Italy), Feijs Loe (Eindhoven University of Technology, The Netherlands)

19:30 DINNER

Ristorante La Smarrita

via Cesare Battisti , 17/a (P.zza Carlo Alberto), Torino

8:30 – 9:00	REGISTRATION	
9:00 – 9:15	OPENING SESSION *MobilWare*	Room 2
9:15 – 10:15	KEYNOTE SPEECH *MobilWare*	Room 2

Monitoring Big, Distributed, Streaming Data
Prof. Assaf Schuster, Computer Science Department, Technion - Israel Institute of Technology

| 10:15 – 10:40 | MORNING TEA |

| 10:40 – 12:30 **Session Fr. A. 1.1** **Energy harvesting // Heart failure** | Room 1 |

- **Optimum Thermoelectric Energy Harvesting for Wearable System Applications,**Alshehhi Rashid Abdulla, Arefin Md Shamsul, Wu Taiyang, Yuce, Mehmet Rasit (Monash University, Australia)
- **Performance Analysis of IEEE 802.15.6 MAC Protocol in WBAN with Energy Harvesting Nodes,**Yun Fan, Liu Bin, Zou Lei (University of Science and Technology of China), Chen Chang Wen (State University of New York, University at Buffalo, USA)
- **A Solar Energy Harvester with an Improved MPPT Circuit for Wearable IoT Applications,** Wu Taiyang, Arefin MD Shamsul, Redoute Jean-Michel, Yuce Mehmet Rasit (Monash University, Australia)
- **Automatic Tinetti test for stroke rehabilitation,** Pagana Guido, Bazzani Marco (Istituto Superiore Mario Boella, Torino, Italy), Demarchi Danilo (Politecnico di Torino, Italy), Sanginario Alessandro (Istituto Italiano Tecnologia, Torino, Italy)
- **Why Do We Need a Remote Health Monitoring System? A Case Study for Congestive Heart Failure Patients,** Pourhomayoun Mohammad (UCLA, USA), Dabiri Foad, Ardestani Ehsan, Samiee Ahsan (WANDA Inc., USA), Ghasemzadeh Hassan (Washington State University, USA), Sarrafzadeh Majid (UCLA, USA)

| 12:20 – 12:30 | Closing remarks – BodyNets |

| 12:30 – 14:00 | LUNCH |

10:40 – 12:00   **Session I (MobilWare)
Intelligent Mobile Services**   Room 2

- **SWAN-Lake: Opportunistic Distributed Sensing for Android Smartphones**, Nicolae Vladimir Bozdog, Roshan Bharath Das, Aart van Halteren, Henri Bal (Vrije Universiteit Amsterdam, The Netherlands)
- **Smart Cane System: Direction Guidance System for the Blind using GS1 and EPCIS System**, Soonil Lim, (Samsung Electronics / KAIST, Korea), Hongkeun Yu, Sanha Kang (LG Electronics / KAIST, Korea), Daeyoung Kim (KAIST, Korea)
- **FaceDate: A Mobile Cloud Computing App for People Matching,** Pradyumna Neog, Hillol Debnath, Jianchen Shan, Nafize Paiker, Narain Gehani, Reza Curtmola, Xiaoning Ding, Cristian Borcea (New Jersey Institute of Technology, USA)
- **Direct and Indirect Access in Machine Type Communications: An Analytical Approach** Panagiotis Sarigiannidis (Aristotle University of Thessaloniki, Greece)

12:30 – 14:00   LUNCH

14:00 – 15:00   KEYNOTE SPEECH *MobilWare*   Room 1

Mobility Coordination in Urban-scale Socio-Technical Systems
Franco Zambonelli, University of Modena and Reggio Emilia

15:00 – 15:20   AFTERNOON TEA

15:20 – 16:30   **Session II (MobilWare)
Wireless and Mobile Networking**   Room 1

- **Mobility Management and Delay Cost Analysis in SDNized WLAN**, Manzoor Ahmed Khan, Patrick Ahmed Engelhard (DAI Labor Technische Universität Berlin, Germany), Tobias Dörsch (GT-ARC gemeinnützige GmbH, Germany)
- **Multi-frame Transfer for Data Dissemination in LTE Device-to-Device Proximity Discovery**, Paolo Bellavista, Jacopo De Benedetto (University of Bologna, Italy)
- **Scalability of Kura-extended Gateways via MQTT-CoAP Integration and Hierarchical Optimizations,** Paolo Bellavista, Alessandro Zanni, (University of Bologna, Italy)

16:20 – 16:30   Closing remarks – MobilWare

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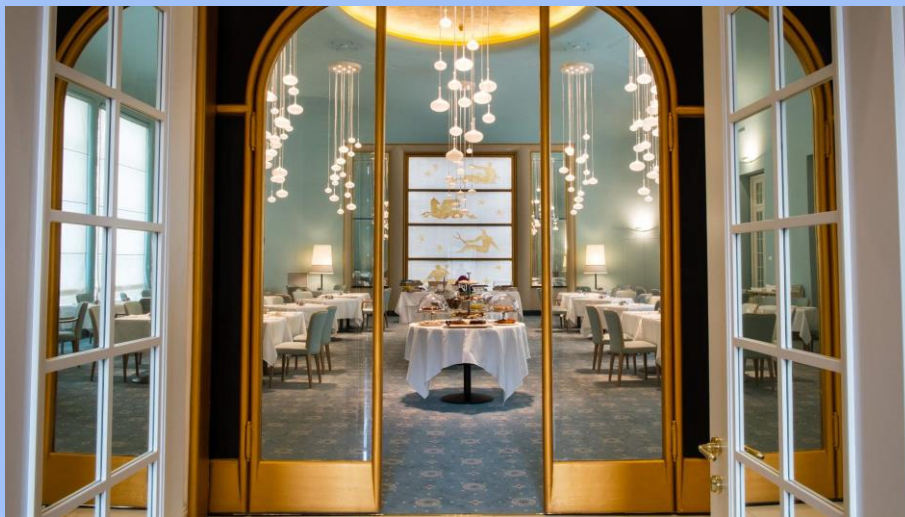
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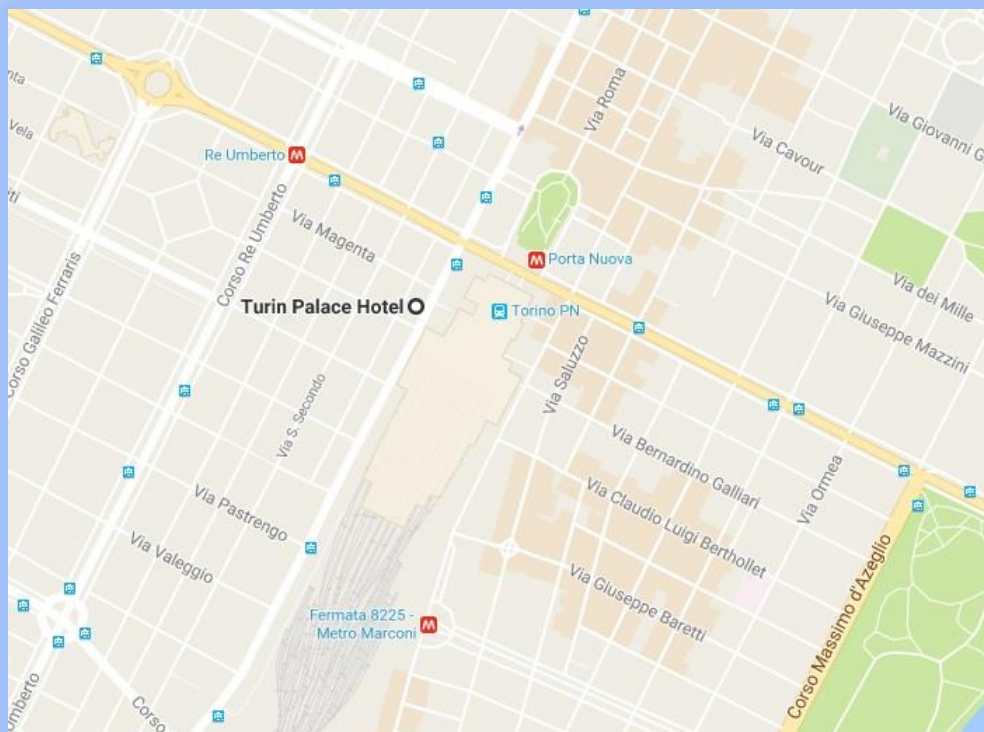
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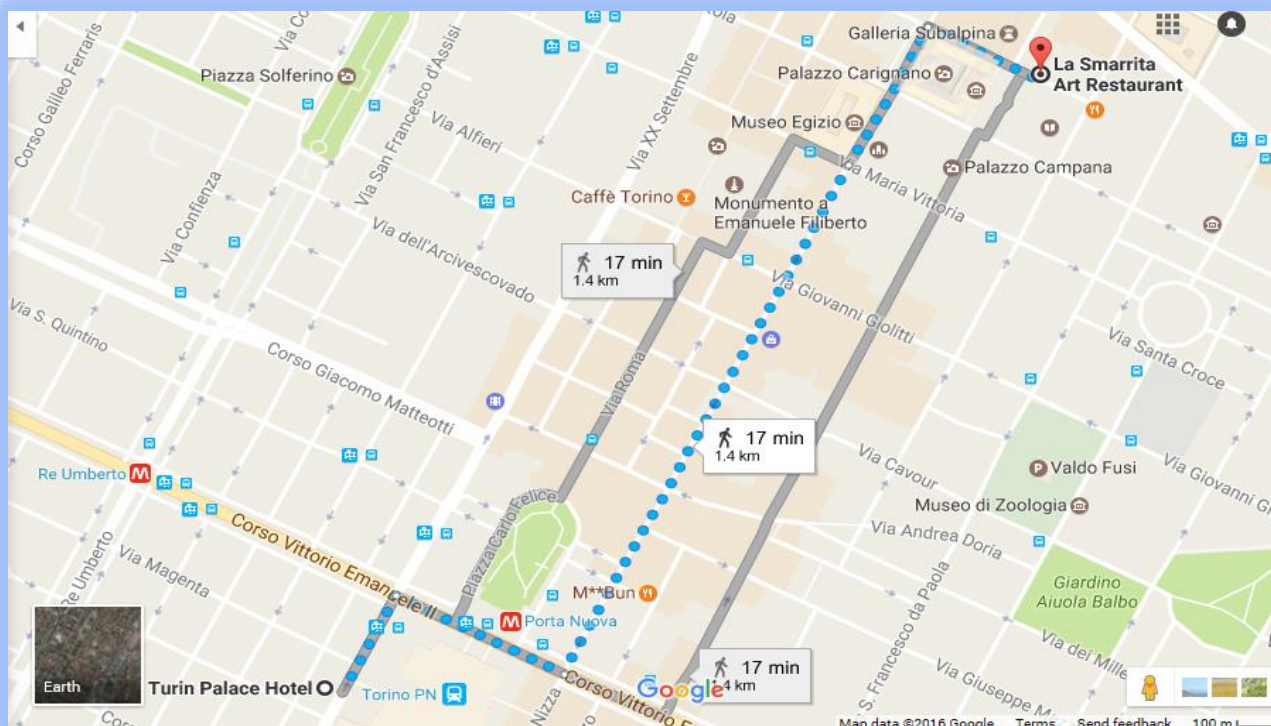
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