

6th EAI International Conference on Wireless Mobile Communication and Healthcare

"Transforming healthcare through innovations in mobile and wireless technologies"

NOVEMBER 14–16, 2016 MILAN, ITALY

INTERNET OF THINGS

SMART CITIES

APPLICATIONS FOR FUTURE INTERNET



E-HEALTH

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WELCOME MESSAGE

GENERAL CHAIR

Dear mobiHealth participants,

Welcome to Milan!Politecnico di Milano is the first technical university in Italy and is happy to have the opportunity to host this prestigious scientific event.

We are experiencing an era of profound transformation when mobile ubiquitous connection makes possible a real innovation of healthcare and wellbeing services. The availability of wearable devices that are integrated like living appendices to the body also enriches the possibility to have a continuous monitoring of parameters and functions. A huge amount of data is produced and new challenges reside into their efficient and timely processing.

This is the worldwide technological scenario in which we are called to operate in and to design innovations and new perspectives.

But the human dimension is the key and driving factor. Too often, a technology driven approach has been followed in building new systems, forgetting, or rather underestimating, the actual user needs and desires, not simply from the clinical point of view, but in a more general vision. This message is to be shared among our community to always improve our developments. In my personal conviction it is the right direction toward a possible exploitation of research results.

In this edition, we tried to integrate this multidisciplinary approach and vision.

For the first time, designers and other non-engineering professionals take part in our conference; a dedicated spin-off pitch session will show cutting-edge solutions in m-Health, three special sessions will focus on specific topics, and a final round table together with the scientific representatives of high level researches (all EU funded projects in e-Health field) will share experiences and design future directions.

Milan is the Italian leading community in experimenting new healthcare solutions in technology and services. For this reason, we will also host the finalists of a mHealth hackathon presenting their final pitch.

We hope that this wider event programme will meet your favour and would help in generating new ideas and in enlarging cross-cultural international collaborations.

A final remark to thank you all the participants but above all the background team that worked so hard to make this real!

Have an enjoying and scientifically fruitful conference!

Giuseppe Andreoni

Politecnico di Milano, Milan, Italy

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Giuseppe De Pietro Director ICAR CNR



ABSTRACT: The Electronic Health Record aims to provide citizen with their healthcare history by storing all data and documents useful for prevention, diagnosis, care and follow-up. In particular, the Italian regulation of EHR contemplates a specific section called "Personal citizen agenda (PCA)" in which users can store "not certified" personal collected data and documents. At present most of user collected data derive from wearable device and smartphone, so it is a key issue to develop services and tools to easily store and retrieve such data in/from PCA. In this talk some "smart" m-health applications for PCA handling will be presented and discussed.

BIO: Giuseppe De Pietro is Director of the Institute for High-Performance Computing and Networking (ICAR) of Italian National Research Council (CNR). Current research interests are: pervasive and mobile computing, Clinical Decision Support Systems, Software architectures for e-health. He has been actively involved in many European and National projects, with industrial co-operations too.

He is author of over 150 scientific papers published in international journals and conferences and he is involved in many program committees and journal editorial boards. He is contract Professor of Computer Science at University of Naples "Parthenope", Adjunt Professor in Temple University's College of Science and Technology-Philapdelphia USA. He is IEEE and KES International Member.

KEYNOTE SPEAKERS

Enrico Frumento Cefriel



ABSTRACT: A recent McKinsey report states that "health systems in developed countries face a twofold challenge: ensuring financial sustainability and improving quality. Digitization can help health systems achieve both these objectives and unlock substantial value through lower spending and superior healthcare delivery."

Indeed, this is not a new vision or claim. However, pursuing this vision is not easy and certainly there is still a long road ahead to make it happen.

Why? What are the "stumbling blocks" that slow down or even hamper this vision? What are the key factors to be taken into account in developing a convincing strategy? Are there meaningful and concrete examples we can exploit to accelerate digital innovation processes?

The talk aims at discussing these issues and also to summarise concrete examples and approaches that might help pursuing such as ambitious and strategic vision.

BIO: He was born in Savona on August 10, 1970. He obtained a Master degree in Biomedical Engineering from University of Genova in 1995 and achieved a specialisation master in digital signal processing. He worked for Cefriel as a researcher in several European research and private-funded innovation projects on Telemedicine and e-health.

Since 2004 he gradually shifted his research interests in the area of unconventional security and cybercrime. Among his activities for Cefriel he participated to different research and innovation projects on secure code development, hacking/cracking techniques (Reverse Code Engineering and penetration testing), social engineering and cybercrime prevention.

Since 2015 he is the scientific coordinator of the European project DOGANA whose aim is to create an European framework for the assessment of human security. He is participating to several cybercrime related task forces (DCC, EECTF, ECSO) and is author of several subject-related papers and books.

KEYNOTE SPEAKERS

Maria Renata Guarneri

Fondazione Politecnico di Milano



ABSTRACT: Obesity and other lifestyle-related illness are among the top healthcare challenges in Europe. Obesity alone accounts for up to 7% of healthcare costs in the EU. Obesity in younger age is an alarming predictor for obesity in adulthood, but also entails short and long term health complications.

Knowing how to stay healthy is not enough to motivate individuals to adopt healthy lifestyles, but relevant progress can be achieved through the use of incentives delivered through a combination of processes and mobile technologies.

Recognizing the effectiveness of this approach, PEGASO Fit 4 Future has develop a multidimensional cross-disciplinary ICT system that exploits wearable sensors, mobile apps and game mechanics to motivate behavioral changes towards healthier lifestyles and prevent overweight and obesity in the younger population.

PEGASO is currently being piloted with over 300 adolescents in three EU member states (Spain, Italy, UK).

BIO: Renata Guarneri is Project Manager in the Project Development - International Area at FPM. Before joining FPM she was Principal Technologist and later Innovation Director at CREATE-NET, responsible for the centre overall research organisation and research strategic directions, including EU funding aspects. She has been fully involved in EU funded research since 1990 when she joined the RACE Industrial Consortium in Brussels to represent Italtel. In 1999 Renata joined Siemens, first in the Marketing and Strategies Department, then in the R&D Department of the Mobile Radio Business Unit. Recently Renata has been involved mainly in project dealing with ICT for Health and she is the project coordinator of PEGASO Fit 4 Future, dealing with prevention of obesity in teen-agers.

PROGRAM OVERVIEW

DAV 1	MONDAY	11	NOVEMBED	2016
UAII	- MUNDAI.	14	NOVEMBER	2010

8:00 – 9:00	REGISTRATION
9:00 – 9:15	OPEN - Welcome
9:15 – 10:30	KEYNOTE

13:00 - 14:30

16:00 – 16:30	COFFEE BREAK
10.00 - 10.30	COFFEE DREAM

PROGRAM OVERVIEW

DAY 2 – TUESDAY, 15 NOVEMBER 2016

8:00 – 9:00	REGISTRATION
9:00 – 9:15	OPEN - Welcome
9:15 – 10:30	KEYNOTE – HACKATHON LAUNCH
10:30 – 11:00	COFFEE BREAK
11:00 – 12:30	7 - DESIGN APPROACH FOR M-HEALTH SOLUTIONS
11:00 – 12:30	8 - FEEL THE FALL
12:30 – 13:00	POSTER SESSION
13:00 – 14:30	LUNCH
14:30 – 16:00	9 - MACHINE LEARNING IN M-HEALTH APPLICATIONS
14:30 – 16:00	10 - SYSTEMS AND APPS FOR MOVEMENT ANALYSIS
16:00 – 16:30	COFFEE BREAK
16:30 – 18:00	SPIN-OFF SESSION
18:00 – 18:15	CONCLUSION
19.30 - 22.30	SOCIAL EVENT AND SOCIAL DINNER

PROGRAM OVERVIEW

DAY 3 – WEDNESDAY, 16 NOVEMBER 2016

8:00 – 9:00 REGISTRATION

9:00 - 9:15 OPEN - Welcome

9:15 - 10:30 KEYNOTE - PEGASO F4F

10:30 - 11:00 COFFEE BREAK

11:00 – 12:30 SPECIAL SESSION ASWM

11:00 - 12:30 EEHM

12:30 – 13:00 HACKATHON FINAL: PITCH AND DEMO

13:00 - 14:30 LUNCH

14:30 – 16:00 WORKSHOP APHS

16:00 – 16:30 COFFEE BREAK

16:30 – 18:00 CONCLUSION AND AWARDS

PROGRAM OVERVIEW

DAY 4 - THURSDAY, 17 NOVEMBER 2016

The MobiHealth Conference will continue with complementary sessions which will take place at Politecnico di Milano in Aula Castiglioni, 3rd floor, edificio B1 Bibilioteca, via Candiani 72, 20158 Milan

9:00 – 9:15	OPEN - Welcome
9:15 – 10:30	EU Project in m_Health round Table
10:30 – 11:00	COFFEE BREAK
11:00 – 12:30	EU Project in m_Health round Table
13:00 – 13:30	LUNCH
14:30 – 16:30	Workshop Games for health
16:30 – 17:00	COFEE BREAK
17:00 - 18:00	Workshop Games for health

DAY 1

8:00 – 9:00 REGISTRATION

9:00 - 9:15 OPEN - Welcome

9:15 - 10:30 KEYNOTE

Speaker: Giuseppe De Pietro (Director ICAR CNR)

Topic: Mobile Healthcare and Electronic Health Record

10:30 – 11:00 COFFEE BREAK

11:00 – 12:30 1 - TECHNOLOGICAL DEVELOPMENT FOR

M-HEALTH APPLICATION

Self-powered implantable electromagnetic device for cardiovascular system monitoring through arterial wall deformation

A Custom Base Station for Collecting and Processing Data of Research-grade Motion Sensor Units

Energy-Efficient IoT-Enabled Fall Detection System with Messenger-Based Notification

11:00 – 12:30 2 - PROMOTION FOR HEALTHY LIFESTYLE

A Mobile Adviser of Healthy Eating by Reading Ingredient Labels

Investigating How to Measure Mobile User Engagement

Personalised Guidance Services for Optimising lifestyle in teen-agers through awareness, motivation and engagement – PEGASO: a pilot study protocol

PEGASO Companion: a Mobile App to Promote Healthy Lifestyles among Adolescents

12:30 – 13:00 POSTER SESSION

13:00 - 14:30 LUNCH

DAY 1

14:30 - 16:00 3 - DEVICE FOR M-HEALTH

SmartMATES for Medication Adherence using Non-intrusive Wearable Sensors

Paradigm-Shifting Players for IoT: Smart-Watches for Intensive Care Monitoring

Toward an Open-Source Flexible System for Mobile Health Monitoring

14:30 – 16:00 4 - SMART APPLICATIONS FOR CLINICAL CARE

A System for Hypertension Management Assistance Based on the Technologies of the Smart Spaces

Enhancing the Early Warning Score System Using Data Confidence

Video and Wearable Monitoring of Tourette Syndrome

Assessment of Physiological Signals during Happiness, Sadness, Pain or Anger

16:00 – 16:30 COFFEE BREAK

16:30 – 18:00 5 - IOT FOR M-HEALTH

A CONTEXT-AWARE, CAPABILITY-BASED, ROLE-CENTRIC ACCESS CONTROL MODEL FOR IOMT

Modular IoT platform for AAL and home care using Bluetooth Low Energy

Non Conventional Use of Smartphones: Remote Monitoring Powered Wheelchairs in MARINER Project

DAY 1

16:30 – 18:00 6 - MOBILE APPLICATIONS FOR HEALTH

Crowdsourced data collection of physical activity and health status: An App Solution

Skinhealth, a mobile application for supporting Teledermatology: A case study in a rural area in Colombia

Smartphone-Based Detection of Location Changes Using WiFi Data

Adaptive Motif-based Alerts for Mobile Health Monitoring

18:00 - 18:15 CONCLUSION

DAY 2

8:45 - 9:00	REGISTRATION
0.40 - 9.00	

Speaker: Enrico Frumento (Cefriel)
Topic: How To Make It Happen

A didactic experience in designing smart systems for mHealth services

DIABESITY: A study for mHealth integrated solutions

A reference framework of mHealth patents for innovative services

Monitoring Patients in Ambulatory Palliative Care: a Design for an Observational Study

11:00 - 12:30 8 - FEEL THE FALL

Fall detection using a head-worn barometer

Investigation of sensor placement for accurate fall detection

Fall Detection with Orientation Calibration Using a Single Motion Sensor

A Neural network model based on co-occurrence matrix for fall prediction

12:30 - 13:00 POSTER SESSION

13:00 - 14:30 LUNCH

DAY
2

14:30 – 16:00 9 - MACHINE LEARNING IN M-HEALTH APPLICATIONS

Using smartwatch sensors to support the acquisition of sleep quality data for supervised machine learning

Multilayer Radial Basis Function Kernal Machine

Improving the Probability of Clinical Diagnosis of Coronary-Artery Disease using Extended Kalman Filters With Radial Basis Function Network

A hypothetical reasoning system for mobile health and wellness applications

14:30 – 16:00 10 - SYSTEMS AND APPS FOR MOVEMENT ANALYSIS

Accuracy of the Microsoft Kinect system in the identification of the body posture

A web based version of the Cervical Joint Position Error Test: reliability of measurements from face tracking software

Motion capture: An evaluation of Kinect V2 body tracking for upper limb movement analysis

Use of Wearable Inertial Sensor in the Assessment of Timed-Up-and-Go Test: Influence of Device Placement on Temporal Variable Estimation

16:00 – 16:30	COFFEE BREAK
10.00 - 10.00	

DAY 3

8:45 - 9:00	REGISTRATION
0.70	

Development of a sustainable and ergonomic interface for the EMG control of prosthetic hands

Synergy-driven Performance Enhancement of Vision-based 3D Hand Pose Reconstruction

A Quantitative Evaluation of Drive Patterns in Electrical Impedance Tomography

Wearable Augmented Reality Optical See Through Displays Based On Integral Imaging

11:00 - 12:30 EEHM

Interference Between Cognitive and Motor Recovery in Elderly Dementia Patients Through a Holistic Tele-Rehabilitation Platform

Supporting physical and cognitive training for preventing the occurrence of dementia using an integrated system: a pilot study

A new Personalized Health System: the SMARTA Project

13:00 - 14:30 LUNCH



14:30 - 16:00 WORKSHOP APHS

Identification of elders' fall using the floor vibration

The Role of Design as Technology Enabler: A Personalized Integrated Predictive Diabetes Management System

Detecting elderly behavior shift via smart devices and stigmergic receptive fields

A pilot study of a Wearable Navigation Device with Tactile Display for Elderly with Cognitive Impairment

16:00 – 16:30 COFFEE BREAK

16:30 – 18:00 CONCLUSION AND AWARDS

SPECIAL SESSIONS

Special Session on "Advances in soft wearable technology for mobile-health" (ASWM)

SCOPE

Current wearables - based on solid-state components - are not suitable to adapt to the deformable nature of the human body. Conversely, soft wearable technology concerns unobtrusive, compliant and lightweight devices that have the potential to enable innovative mobile health applications. Examples of such technology are e-textiles and flexible or stretchable devices that have been employed for on-body, unobtrusive and ambulatory biomedical parameter monitoring or patients treatment (physiological sensing, human motion analysis, electrical stimulation, biomedical sensing, home-based rehabilitation, biofeedback).

ORGANIZERS:

Nicola Carbonaro and Alessandro Tognetti

Research Center "E.Piaggio" and Department of Information Engineering, School of Engineering, University of Pisa

DAY 3 11:00 - 12:30

CONFERENCE WORKSHOPS

"Emerging experiences into receiving and delivering healthcare through mobile and embedded solutions" (EEHM)

SCOPE

Collaborative research between academia and industry in mobile and embedded technologies for healthcare is nowadays changing the way people receive and deliver healthcare. Innovative models for the continuity of care outside of clinical environments have been designed, prototyped and tested in real contexts with patients, caregivers and clinical professionals, as well as new business models having been identified to turn such service prototypes into viable market solutions for the near future. Mobile and embedded technologies in our surroundings have been progressively enhancing homes and neighbourhoods with capabilities for people's health and wellbeing, such as: behaviour recognition, disease prevention, healthy habits encouragement, cognitive fitness and social participation, just to cite a few examples.

ORGANISERS

Eng. Cristina De Capitani,

Senior Technologist, Institute for polymers, composites and biomaterials, National Research Council of Italy

Cluster Manager TechForLife (Lombardy Cluster Technologies for Living Environment)

DAY 3 11:00 - 12:30

CONFERENCE WORKSHOPS

International Workshop on "Advances in Personalized Healthcare Services, Wearable Mobile Monitoring, and Social Media Pervasive Technologies" (APHS)

SCOPE

Modern mobile healthcare systems, supported by information and communication technologies, provide solutions for improving illness prevention, facilitating chronic disease management, empowering patients, enable personalization of care improving the productivity of healthcare provisioning and improve utilization of healthcare enabling the management of diseases outside institutions as well as encouraging citizens to remain healthy.

Personalized healthcare emphasizes on the use of information about an individual/patient to select or optimize patient's preventative, therapeutic care and wellbeing. Modern healthcare solutions emphasize on the need to empower citizens to manage their own health and disease and include smart medical sensors, remote eHealth monitoring, smart-phone enabled data aggregation, medical awareness and analysis and context-aware assistive living technologies.

ORGANIZERS:

Emmanouil Spanakis

(Computational BioMedicine Laboratory, Institute of Computer Science, FORTH)

DAY 3 14:30 - 16:00

CONFERENCE WORKSHOPS

e-Health: the 21st Century Games Revolution An interactive workshop about games for health (Games for Health)

SCOPE

The eHealth sector is one of fastest growing sector today and as such, promotes the creation of various technological solutions, all of them individually facing similar challenges and dilemmas. This workshop will have a specific focus on games and represents a space where Industry meets EU research projects for discussing how to concretely exploit projects' outcomes and experiences into real-world health practice and how to concretely and effectively make eHealth work. Starting from a presentation of the three inviting EU projects, PEGASO, DOREMI and MyCyFAPP, through a discussion on concrete business scenarios and on state of the art technology solutions, this workshop represents a bridge between research and market needs. Participants will reflect on sustainable solutions that guarantee a high impact in real working settings: this workshop is conceived for people creating solutions to present their work to people from practice interested in these solutions and viceversa.

ORGANIZER:

Lucia Pannese, imaginary srl.

DAY 4 14:30 – 16:30

COMMITTEES

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Imrich Chlamtac, University of Trento, Create-Net, Italy

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Roberto Sironi, Politecnico di Milano, Milan, Italy

Conference Manager: Jana Haluskova, EAI - European Alliance for Innovation

CONFERENCE VENUE

Politecnico di Milano Leonardo Campus



Address:
Piazza Leonardo da Vinci, 32
20133 Milano

The gala dinner will take place at Spazio Donizetti



Address:
Spazio Donizetti, Piazza Lombardia 1, 20124
Milan; ground floor of the building

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www.infoscale.org





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CONFERENCE NOTES



EAI was created by leaders from industry, research, and policy making organisations to engage the global community with the shared goal of securing Europe's future competitiveness through innovation.

By harnessing the potential of the ICT revolution, EAI engages the global community in all sectors of society to explore ways in which innovation in technology and business can benefit society at large.

Through its institutional members, EAI endorses hundreds of events around the world as one of the largest scientific meeting supporters. EAI is involved in the technical program development of events including scientific meetings, trade events, training workshops, seminars, fairs, and other programs worldwide.

FOR MORE INFORMATION ABOUT EAI CONFERENCES AND HOW TO BECOME A MEMBER

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Thank you for participating at EAI conference!

We hope to see you again!