

2015
6th IEEE International Workshop
on Advances in Sensors and
Interfaces,
IWASI



IEEE COMPONENTS, PACKAGING AND
MANUFACTURING TECHNOLOGY SOCIETY



Technical Program

June 18-19, 2015
Gallipoli , Italy

Sponsors:



Program Overview

June 18, 2015	
8:30	Welcome and Opening Remarks
9:00	Opening speech: Evgeny Katz - Clarkson University, New York, USA "Implantable Biofuel Cells Operating In Vivo - Potential Power Sources for Bioelectronic Devices"
9:40	Session I: "Biomedical Interfaces"
10:55	Coffee break and Poster Session I
11:00	Session II : "Detectors and sensors for high energy physics applications"
13:30	Lunch
15:00	Session III : "Frontiers in technologies and devices for health care"
16:45 – 17:15	Coffee break and Poster Session I
17:30	Guided tour of Lecce
21:00	Social Dinner at Costa Brada

June 19, 2015	
9:15	Opening speech: Jan M. Rabaey - University of California at Berkeley, USA "Brain - Machine Interfaces - The Core of the Human Intranet"
09:55	Session IV: Neural Interfaces, Neural-Inspired Architectures and Resistive Sensor Interfaces
10:55	Coffee Break and Poster Session II
11:30	Plenary speech on hot topic : Georges Gielen – KU Leuven, Belgium Design of low-power sensor interfaces in the IoT era
12:10	Session V: Ambient Assisted Living
13:15	Lunch
15:00	Coffee Break and Poster Session II
15:30	Session VI : "Biomedical and physical sensor interfaces"
17:00	Session VII: "New Trends in Devices"
18:30	Closing Ceremony and IWASI 2015 Awards

June 18, 2015

8:00

Registration

Welcome and Opening Remarks

08:30

Eugenio Di Sciascio Rector of Politecnico di Bari, Italy
Mauro De Palma Director of INFN Bari, Italy
Antonio Gabellone, President of the Lecce district
Francesco Errico Major of Gallipoli
Daniela De Venuto, Workshop Chair (Politecnico di Bari, Italy)

IWASI 2015 Opening Speech

Chair: Daniela De Venuto (Politecnico di Bari, Italy)

09:00

Evgeny Katz - Clarkson University, New York, USA
Implantable Biofuel Cells Operating In Vivo - Potential Power Sources for Bioelectronic Devices

Session I : "Biomedical interfaces"

Chair: Sandro Carrara (EPFL Lausanne CH)

09:40

Invited Speaker: David Cumming, University of Glasgow – UK.
"Hybridising photonic and biotechnologies to CMOS"

10:10

Matteo Carpentiero, Domenico Caputo, Juri Gambino, Nicola Lovecchio, Giampiero de Cesare and Augusto Nascetti
Amorphous Silicon Differential Photodiodes for Thermal Effects Minimization in Biomolecular Analysis

10:25

Sven Schröder, Özgü Dogan, Gabriel Bertotti, Stefan Keil, Hassan Gargouri, Michael Arens, Evelin Brose, Jürgen Bruns, Dirk Wolanski, Bernd Tillack, Stefano Vassanelli, Bernd Szyszka, Roland Thewes and Jessica Schneidewind
Three Dimensional ALD of TiO₂ for In-Vivo Biomedical Sensor Applications

10:40

Frank Kupfer, Silvia Maria Lattanzio, Marta Maschietto, Andrés Botos, Marlies Mahnkopf, Jürgen Bruns, Matthias Schreiter, Stefano Vassanelli and Roland Thewes
A Si-Chip-Based System for Highly Parallel Electroporation of Cells

10:55

Coffee break and Poster Session I

All the paper to be presented as poster in session I are listed at the end of the program
Chair : Chris Martin (Glasgow University)

Session II : "Detectors and sensors for high energy physics applications"

Chair: Eugenio Nappi (INFN Bari, Italy)

11:30

Invited Speaker: Michael Campbell, CERN, Geneva, Switzerland
Tiling of Large Area X-ray Detectors with Medipix3 and Charged Particle Tracking within a Semiconductor Sensor with Timepix3

12:00

Invited Speaker: Leonardo Rossi, Research Director INFN - section of Genova, Italy
Hybrid pixel detectors at the Large Hadron Collider: past and future

12:30

Daniele Passeri, Arianna Morozzi, Leonello Servoli, Keida Kanxheri, Silvio Sciortino and Stefano Lagomarsino
Simulation and Test of Silicon-on-Diamond Sensors for Particle Detection

12:45	N Demaria, G Dellacasa, G Mazza, A Rivetti, M.D.Da Rocha Rolo, E Monteil, L Pacher, F Ciciriello, F Corsi, C Marzocca, G De Robertis, F Loddo, C Tamma, M Bagatin, D Bisello, S Gerardin, S Mattiazzo, L Ding, P Giubilato, A Paccagnella, F De Canio, L Gaioni, M Manghisoni, V Re, G Traversi, E Riceputi, L Ratti, C Vacchi, R Beccherle, G Magazzu, F Morsani, F Palla, M Minuti, V Liberali, S Shojaii, A Stabile, G.M Bilei, M Menichelli, E Conti, S Marconi, D Passeri and P Placidi CHIPIX65: developments on a new generation pixel readout ASIC in CMOS 65 nm for HEP experiments
13:00	Gianluigi Chiarello, Claudio Chiri, Alessandro Corvaglia, Francesco Grancagnolo, Marco Panareo, Aurora Pepino, Carlo Pinto and Giovanni Tassielli A high performace Front End for MEG II tracker
13:15	Luigi Dilillo, Alexandre Bossier, Viyas Gupta, Frédéric Wrobel and Frédéric Saigne Real-Time SRAM Based Particle Detector

13:30	Lunch
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Session III : “Frontiers in technologies and devices for health care” Chair: Franco Docchio (University of Brescia (Italy))	
15:00	Invited Speaker: Ana Claudia Arias University of California at Berkeley, USA Flexible Printed Electronics for Vital Signs Monitoring
15:30	Invited Speaker: Chris Van Hoof IMEC Leuven Belgium Wearable Health Solutions: technologies for cure, care and prevention
16:00	Shuang Song, Michiel Rooijackers, Pieter Harpe, Chiara Rabotti, Massimo Mischi, Arthur van Roermund and Eugenio Cantatore A Low-power Frontend System for Fetal ECG Monitoring Applications
16:15	Vana Jelacic, Michele Magno, Kiran Chikkadi, Cosmin Roman, Christofer Hierold, Vedran Bilas and Luca Benini Towards Internet of Things for Event-Driven Low-Power Gas Sensing using Carbon Nanotubes
16:30	Anduaem Maereg Tadesse, Davide Brunelli, Bernhard Vodermayr, Markus Nowak and Claudio Castellini Low cost wearable Multichannel Surface EMG Acquisition for Prosthetic Hand Control

16:45 – 17:15	Coffee break and Poster Session I All the paper to be presented as poster in session I are listed at the end of the program Chair : Valerio Annese (Politecnico di Bari Italy)
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17:30	Guided Tour of Lecce
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21:00	Social Dinner at Costa Brada Resort
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June 19, 2015

Opening Speech

Chair: Daniela De Venuto (Politecnico di Bari, Italy)

09:15

Jan M. Rabaey - University of California at Berkeley, USA
Brain - Machine Interfaces - The Core of the Human Intranet

Session IV : “Neural Interfaces, Neural-Inspired Architectures and Resistive Sensor Interfaces”

Chair: Roland Thewes (TU Berlin, Germany)

09:55

Invited Speaker: David Linde, Medtronic Neuromodulation Minneapolis, USA
Creating Windows into the Brain

10:10

Valerio Francesco Annese and Daniela De Venuto
FPGA based architecture for Fall-Risk Assessment during Gait Monitoring by synchronous EEG/EMG

10:25

Bahman Yousefzadeh, Ugur Sonmez, Nandish Mehta, Jonathan Borremans, Michiel Pertijs and Kofi Makinwa
A Generic Read-out Circuit for Resistive Transducers

10:40

Paolo Motto Ros, Marco Crepaldi and Danilo Demarchi
A Hybrid Quasi-Digital/Neuromorphic Architecture for Tactile Sensing in Humanoid Robots

10:55

Coffee break Poster Session II

All the paper to be presented as poster in session I are listed at the end of the program
Chair: Michele Ruta (Politecnico di Bari)

Plenary Speech on Hot Topic

Chair: Daniela De Venuto (Politecnico di Bari, Italy)

11:30

Keynote: Georges Gielen – KU Leuven, Belgium
Design of low-power sensor interfaces in the IoT era

Session V: “Ambient Assisted Living”

Chair: Pietro Siciliano (CNR-IMM Lecce, Italy)

12:10

Invited Speaker: Gaetano Grasso, InnovaPuglia SpA
Living Labs: Service-Oriented Communities for the Caring Economy

12:30

Matteo Lancini, Mauro Serpelloni and Simone Pasinetti
Instrumented crutches to measure the internal forces acting on upper limbs in powered exoskeleton users

12:45

Eleonora Vecchio, K. Ricci, A. Montemurno, Marina de Tommaso, Valerio Francesco Annese and Daniela De Venuto
Combined EEG/EMG Evaluation during a Novel Dual Task Paradigm for Gait Analysis

13:00

Andrea Caroppo, Giovanni Diraco, Gabriele Rescio, Alessandro Leone and Pietro Siciliano
Heterogeneous Sensor Platform for Circadian Rhythm Analysis

13:15

Lunch

15:00	Coffee break and Poster Session II All the paper to be presented as poster in session I are listed at the end of the program
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Session VI : “Biomedical and physical sensor interfaces” Chair: Eugenio Cantatore	
15:30	Invited Speaker: Michiel Pertijs Delft University of Technology, The Netherlands Low-Power Receive Electronics for a Miniature Real-Time 3D Ultrasound Probe
16:00	Maria-Alexandra Paun Single and multi-phase offset numerical estimation for CMOS Hall Effect devices
16:15	Edoardo Charbon Large Format Single-Photon and Multi-Photon Imaging
16:30	Fabio Ciciriello, Francesco Corsi, Francesco Licciulli, Cristoforo Marzocca and Gianvito Matarrese Time Performance of Voltage-mode vs Current-mode Readouts for SiPM’s
16:45	Benedetta Nodari, Michele Caldara, Valerio Re and Lorenzo Fabris Radon fast detection and environmental monitoring with a portable wireless system

Session VII: “New Trends in Devices” Chair: Giampiero de Cesare (Università di Roma, La Sapienza Italy)	
17:00	Invited Speaker: Róisín M. Owens, Ecole des Mines de St. Etienne, France Organic Electronic Devices for Label-Free Monitoring of in Vitro Toxicology
17:30	Mandeep Singh, M.Y. Mulla, Kyriaki Manoli, Maria Magliulo, Nicoletta Ditaranto, Nicola Cioffi, Gerardo Palazzo, Luisa Torsi, M. V. Santacroce, Cinzia Di Franco and G. Scamarcio Bio-functionalization of ZnO water gated thin-film transistors
18:00	Andrei Vladimirescu, Costin Anghel and Adam Makosiej Sub-Picowatt Retention-Mode TFET Memory for CMOS Sensor Processing Nodes
18:15	Woongrae Kim, Chang-Chih Chen, Taizhi Liu, Soonyoung Cha and Linda Milor Estimation of Remaining Life Using Embedded SRAM for Wearout Parameter Extraction

Closing Ceremony	
18:30	Greetings and Acknowledgements from Prof. D. De Venuto, Workshop Chair
	IWASI 2015 Awards: 1. Best Poster Presentation Award 2. Best Oral Presentation Award 3. Best Paper Award Scientific Jury: - De Venuto, - Thewes - Cantatore - Nappi - Gielen

Poster Session I

Francesca Romana Parente, Giuseppe Ferri, Vincenzo Stornelli, Giorgio Pennazza, Marco Santonico and Arnaldo D'Amico

A standard CMOS technology fully-analog differential capacitance sensor front-end

Nicola Lovecchio, Giulia Petrucci, Domenico Caputo, Samia Alameddine, Matteo Carpentiero, Luca Martini, Emanuele Parisi, Giampiero de Cesare and Augusto Nascetti

Thermal control system based on thin film heaters and amorphous silicon diodes

Roberto Massari, Domenico Caputo, Silvia Ronchi and Alessandro Soluri

Low power readout circuits for large area silicon photomultiplier array

Laura Verde, Giovanna Sannino, Giuseppe De Pietro and Pierangelo Veltri

A Noise-Aware Methodology for a Mobile Voice Screening Application

Giancarlo Bartolucci, Giovanni Maria Sardi, Romolo Marcelli, Emanuela Proietti, Andrea Lucibello, Endri Stoja and Fabrizio Frezza

Analytical evaluation of the capacitance of a conical sensor for micro-nano imaging techniques

Giampiero de Cesare, Domenico Caputo and Augusto Nascetti

Simultaneous measurement of light and temperature by a single amorphous silicon sensor

Francesco Barile and Vito Manzari

Characterization of the prototype pixel chip for the ALICE ITS upgrade

Nisrina Abdo, Denis Sallin, Magali Estribeau, Pierre Magnan, Adil Koukab and Maher Kayal

Optical effect considerations for bulk to SOI retargeting of hybrid MOS-PN dynamic photo-sensor

Gianluigi Chiarello, Claudio Chiri, Alessandro Corvaglia, Franco Grancagnolo, Alessandro Miccoli, Marco Panareo, Aurora Pepino, Carlo Pinto, Patrizio Primiceri, Matteo Spedicato and Giovanni Francesco Tassielli

A new assembly technique of full stereo Drift Chamber for High Energy Physics experiments

Mirko Pasca, Stefano D'Amico, Vincenzo Chironi, Luca Catarinucci, Danilo De Donno, Riccardo Colella and Luciano Tarricone

A -19dBm Sensitivity Integrated RF-DC Converter with Regulated Output Voltage for Powering UHF Wireless Sensors

Alessandro Corvaglia, Marco Panareo, Maria Paola Panetta and Carlo Pinto

Voltage Control System for the EEE Project's MRPCs

Nicola Antonio Lamberti, Monica La Mura, Valerio Apuzzo, Alessandra Casella, Pasquale D'Uva, Giosuè Caliano and Alessandro Stuart Savoia

A Resonant Sensor for Liquid Density Measurement Based on a Piezoelectric Bimorph

Simone Pasinetti, Matteo Lancini and Viviane Pasqui

Development of an optomechanical measurement system for dynamic stability analysis

Luigi Benussi, Stefano Bianco, Michele Caponero, Saleh Muhammad, Giovanna Saviano, Davide Piccolo, Daniele Pierluigi, Luciano Passamonti, Guido Raffone and Alessandro Russo

Fiber Bragg Grating sensors for deformation monitoring of GEM foils in HEP detectors

Maria Rita Coluccia, Marco Panareo, Ivan De Mitri, Alessandro Corvaglia, Gianluigi Chiarello and Carlo Pinto

The DAQ System for CORAM (COsmic RAY Mission) Experiment

Poster Session II

Chris Martin, Théophile Dejardin, Andrew Hart, Mathis Riehle and David Cumming
Towards a Biodegradable, Electro-Active Nerve Repair Conduit

Ardalan Lotfi, Francesca Puppo, Danilo Demarchi, Giovanni De Micheli and Sandro Carrara
Reliable Redundancy with Memristive-Biosensors to achieve Statistical Significance in Immunosensing

Giulio Romano, Paolo Lorenzi, Fernanda Irrera, Rosario Rao, Ardi Kita, Martin Serpa, Federico Filesi, Matteo Bologna, Antonello Suppa and Alfredo Berardelli
Smart sensors for the recognition of specific human motion disorders in Parkinson's disease

Leonarda Carnimeo, Anna Cinzia Benedetto and Rosamaria Nitti
A Neural Network-based Retinal Imaging Interface for Optic Disc Localization in Ophthalmic Analyses

Davide Giovanelli, Bojan Milosevic and Elisabetta Farella
Bluetooth Low Energy for Data Streaming: Application-level Analysis and Recommendation

Daniele Comotti, Michele Caldara, Michael Galizzi, Patrick Locatelli and Valerio Re
Inertial Based Hand Position Tracking for Future Applications in Rehabilitation Environments

Vincenzo Chironi, Mirko Pasca, Pietro Siciliano and Stefano D'Amico
A 5.8-13~GHz SDR RF Front-end for Wireless Sensors Network Robust to Out-of-Band Interferers in 65nm CMOS

Carlo Veri, Mirko Pasca, Stefano D'Amico, Luca Francioso, Chiara De Pascali and Pietro Siciliano
A Flexible Thermoelectric Generator with a Fully Electrical, Low Startup Voltage and High Efficiency DC-DC Converter

Trong Nhan Le, Alain Pegatoquet and Michele Magno
Asynchronous on Demand MAC Protocol Using Wake-Up Radio in Wireless Body Area Network

Kerem Kapucu and Catherine Dehollain
A Passive UHF RFID Platform for Sensing Applications

Fiona Edwards Murphy, Michele Magno, Liam O'Leary, Killian Troy, Pádraig Whelan and Emanuel Popovici
Big Brother for Bees (3B) – Energy Neutral Platform for Remote Monitoring of Beehive Imagery and Sound

Eliana Bove
Object (b)logging: semantically rich context mining and annotation in pervasive environments

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