

## Welcome Message

The IEEE International Symposium MeMeA 2013 is the eighth edition of a successful international series of scientific meetings in the field of measurements in medicine and health care. Over the years, this event has developed into one of the most important communication forums for the community of researchers in medical measurements.

All medical applications include a measurement component to acquiring correct and trustworthy data, hence a constant positive trend of extending the topics of the presented papers. The central challenges of the field continue to re-emerge, so some of our previous opinions on the scope of MeMeA are still of actuality. Medical measurements have to deal with the measurands' variability, both over time and between patients, being caused by a multitude of intrinsic and extrinsic factors, some known and some unknown. There is a constant desirability for non-invasive or minimally-invasive measurements, often a highly constraining requirement. Last but not least, there is strict need for high reliability, a requirement that is not always met by current technologies. And, as if these challenges were not enough, the developer of medical measurement systems has to keep in mind cost-conscious governments, fussy clinicians, and very demanding regulatory agencies.

Physiological measurements and Biosignal processing remained the most preferred topics for the researchers' presentations this year, with an emphasis on Testing and Calibration. Highly popular topics are also Sensors for medical systems, Smart homes and Patients' rehabilitation. The number of papers increased over the years, along with rising exigency of the selection procedure. After a rigorous reviewing process, 73 papers have been accepted for publication. The 306 authors of the selected contributions are from universities, industry, government, NGO or medical research centers from 20 countries in North and South America, Europe, and Asia.

A special thank you goes to all of the Technical Program Committee members and the reviewers who have contributed to make this outstanding program possible. Also, we would like to thank all the participants and members of the organizing committee for making this eighth edition of MeMeA a great success. Last but not least, we want to express our gratitude to our patrons who constantly supported this event over the years.

Welcome to MeMeA 2013 in Gatineau, Quebec, Canada!

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## Saturday, May 4

09:00 - 10:00

### Plenary Opening Session

Room: *Grand Salle*

#### **Designing Medical Devices for a Global Marketplace**

*Richard A. Bonato, Ph.D., M.A., RST, RPSGT, Co-Founder & Chief Executive Officer BRAEBON Medical Corporation*

10:00 - 10:20

### Morning Break

10:20 - 12:00

### Cardiac Signal Processing

Chair: *Hilmi R Dajani (University of Ottawa, Canada)*

Room: *C0420*

10:20

#### **Real-Time Biosignal Quality Analysis of Ambulatory ECG for Detection of Myocardial Ischemia**

*Patrick X. Quesnel (Carleton University, Canada)*

*Adrian D.C. Chan (Carleton University, Canada)*

*Homer Yang (The Ottawa Hospital, Canada)*

10:40

#### **A Windowed Impulse Rejection Filter for HRV Artifact Detection**

*Hussein Al Osman (University of Ottawa, Canada)*

*Mohamad A. Eid (University of Ottawa, Canada)*

*Abdulmotaleb El Saddik (University of Ottawa, Canada)*

11:00

#### **How Speech Processing Can Help With Beat-to-beat Heart Rate Estimation in Ballistocardiograms**

*Christoph Brüser (RWTH Aachen University, Germany)*

*Stefan Winter (Philips Technologie GmbH Innovative Technologies, Research Laboratories, Aachen, Germany)*

*Steffen Leonhardt (RWTH Aachen University, Germany)*

11:20

#### **Evaluation of the Correlation Between Blood Pressure and Pulse Transit Time**

*Xiaochuan He (Carleton University, Canada)*

*Rafik Goubran (Carleton University, Canada)*

*Peter Liu (Carleton University, Canada)*

11:40

#### **Using the heart harmonics in the oscillometry to extract the blood pressure**

*Kurt Barbé (Vrije Universiteit Brussel, Belgium)*

*Francesco Lamonaca (University of Calabria, Italy)*

*Yuriy Kurylyak (University of Calabria, Italy)*

*Wendy Van Moer (Vrije Universiteit Brussel, Belgium)*

**10:20 - 12:00**

**Imaging**

**Chair:** Gregorio Andria (*Politecnico di Bari, Italy*)

**Room:** C0422

**10:20 An easy-to-use TW3 system for assessing bone age**

*Chi-Wen Hsieh (National Chiayi University, Taiwan)*

*Hung-Chun Chien (Jinwen University of Science and Technology, Taiwan)*

*Tai-Lang Jong (National Tsing Hua University, Taiwan)*

*Chih-Yen Chen (Instrument Technology Research Center, Taiwan)*

*Chih-Chung Chou (National Applied Research Laboratories, Taiwan)*

**10:40 Assessment of the Enhancement Potential of Halloysite Nanotubes for Echographic Imaging**

*Giulia Soloperto (National Council of Research, Institute of Clinical Physiology, Lecce, Italy)*

*Francesco Conversano (National Council of Research, Institute of Clinical Physiology, Lecce, Italy)*

*Antonio Greco (National Council of Research, Institute of Clinical Physiology, Lecce, Italy)*

*Ernesto Casciari (National Council of Research, Institute of Clinical Physiology, Lecce, Italy)*

*Andrea Ragusa (National Nanotechnology Laboratory of CNR-NANO, Lecce, Italy)*

*Aime' Lay-Ekuakille (University of Salento, Italy)*

*Stefano Loporatti (National Nanotechnology Laboratory of CNR-NANO, Lecce, Italy)*

*Sergio Casciari (National Council of Research, Institute of Clinical Physiology, Lecce, Italy)*

**11:00 Manual segmentation certification platform**

*Simon Duchesne (Universite Laval & Institut Universitaire en Sante Mentale de Quebec, Canada)*

*Fernando Valdivia (Institut Universitaire en Sante Mentale de Quebec, Canada)*

*Nicolas Robitaille (Institut Universitaire en Sante Mentale de Quebec, Canada)*

*Martina Bocchetta (LENITEM - IRCCS S. Giovanni di Dio, Italy)*

*Marina Boccardi (LENITEM - IRCCS S. Giovanni di Dio, Italy)*

*Clifford Jack Jr (Mayo Clinic and Foundation, USA)*

*Giovanni Frisoni (IRCCS San Giovanni di Dio, Brescia, Italy)*

**11:20 Ultrasonic Measurements of Shear Wave Propagation in Soft Tissue Phantom for Tissue Characterization**

*Zhen Qu (Carleton University, Canada)*

*Yuu Ono (Carleton University, Canada)*

**11:40 Facial Expression Communication for Healthcare Androids**

*Patrick J Santos (University of Ottawa, Canada)*

*Erbene Maia, Jr (Military Institute of Engineering & University of Ottawa, Canada)*

*Miriam Goubran (University of Ottawa, Canada)*

*Emil M. Petriu (University of Ottawa, Canada)*

**12:00 - 13:30 Lunch**

**12:00 - 15:30**

**Poster Session**

**Chair:** Yuu Ono (Carleton University, Canada)

**Room:** Grand Salle

**Selection of Wavelet Functions and Thresholding Parameters in Ultrasound Image Denoising**

*Gregorio Andria (Politecnico di Bari, Italy)*

*Filippo Attivissimo (Politecnico di Bari, Italy)*

*Giuseppe Cavone (Politecnico di Bari, Italy)*

*Anna Maria Lucia Lanzolla (Politecnico di Bari, Italy)*

**Novel method and real-time system for detecting the Cardiac Defense Response based on the ECG**

*Roberto Covello (Università della Calabria, Italy)*

*Giancarlo Fortino (Università della Calabria, Italy)*

*Raffaele Gravina (DEIS - University of Calabria, Italy)*

*Antonio Aguilar (DERI, Galway, Ireland)*

*John Breslin (DERI, Galway, Ireland)*

**Correcting Smartphone Orientation for Accelerometer-Based Analysis**

*Marco D Tundo (University of Ottawa & The Ottawa Hospital Research Institute, Canada)*

*Edward Lemaire (University of Ottawa, Canada)*

*Natalie Baddour (University of Ottawa, Canada)*

**Fabrication and Simulation of Implantable Glucose Bio Fuel Cell with Gold catalyst**

*Soheil Ghaffari (University of Tabriz, Iran)*

*Ali Asgarpour (Azad University of Urmia, Iran)*

*Mir Razi Mousavi (University of Tabriz, Iran)*

*Mahsa Salehieh (Azad University of Tabriz, Iran)*

**Modeling an Artificial Pancreas using Retarded Impulsive Differential Equations**

*Luigi Piper (University of Salento, Italy)*

*Aime' Lay-Ekuakille (University of Salento, Italy)*

*Donato Scolozzi (University of Salento, Italy)*

*Emanuela De Franchis (University of Salento, Italy)*

*Patrizia Vergallo (University of Salento, Italy)*

*Giuseppe Griffo (University of Salento, Italy)*

**A Social Network Framework to Support Relatives of Hospitalized Patients**

*Fahad Aldosri (King Saud University, Saudi Arabia)*

*Muhammad Shoaib (King Saud University, Saudi Arabia)*

*Atif Alamri (King Saud University, Saudi Arabia)*

**Portable Skin Analyzer Based on Smartphone**

*Chih-Chieh Wu (Instrument Technology Research Center, Taiwan)*

*Shih-Jie Chou (Instrument Technology Research Center, Taiwan)*

*Tai-Shan Liao (Instrument Technology Research Center, Taiwan)*

*Chi-Hung Hwang (Instrument Technology Research Center, Taiwan)*

**A Novel Method for the Production and Characterization of Calcium Phosphate Biomaterials**

*Francesco Lamonaca (University of Calabria, Italy)*

*Valentina Nastro (University of Calabria, Italy)*

*Alfonzo Nastro (University of Calabria, Italy)*

**Usefulness Analysis of a Clinical Data Repository Design**

*Daphne E. Ong (Carleton University, Canada)*

*Monique Frize (Carleton University, Canada)*

*Jeff Gilchrist (Carleton University, Canada)*

*Erika Bariciak (Children's Hospital of Eastern Ontario, Canada)*

*Colleen M. Ennett (Philips Research North America, USA)*

**Towards Accurate NIBP Simulators: Manufacturers' and researchers' contributions**

*Eulalia Balestrieri (University of Sannio, Italy)*

*Pasquale Daponte (University of Sannio, Italy)*

*Sergio Rapuano (University of Sannio, Italy)*

**A Polynomial Filtering Model for Enhancement of Mammogram Lesions**

*Vikrant Bhateja (Shree Ram Swaroop Memorial University, Lucknow, India)*

*Shabana Urooj (Gautam Buddha University, India)*

*Mukul Misra (Shree Ram Swaroop Memorial University, Lucknow, India)*

*Ashutosh Pandey (SRMGPC, Lucknow, India)*

*Aime' Lay-Ekuakille (University of Salento, Italy)*

**Image-Based Detection of Kayser-Fleischer Ring in Patient with Wilson Disease**

*Rosario Morello (University Mediterranea of Reggio Calabria, Italy)*

*Claudio De Capua (University of Reggio Calabria, Italy)*

*Laura Fabbiano (Politecnico di Bari, Italy)*

*Gaetano Vacca (Politecnico di Bari, Italy)*

**Individual identification using electrocardiogram morphology**

*Antonio Fratini (University of Naples Federico II, Italy)*

*Mario Sansone (University of Naples Federico II, Italy)*

*Paolo Bifulco (University of Naples Federico II, Italy)*

*Giovanni D'Addio (S. Maugeri Foundation, Rehabilitation Institute of Telese, Italy)*

*Maria Romano (University of Naples Federico II, Italy)*

*Alessandro Pepino (University of Naples Federico II, Italy)*

*Mario Cesarelli (University of Naples Federico II, Italy)*

**A Joint Localizer for Finger Length Measurements**

*WeiWen Wang (National Taiwan University, Taiwan)*

*KaiWen Lee (National Taiwan University, Taiwan)*

*ShengYen Lin (National Taiwan University, Taiwan)*

*ChiaHsun Lin (National Taiwan University, Taiwan)*

*LiChen Fu (National Taiwan University, Taiwan)*

*Jin-Shin Lai (National Taiwan University, Taiwan)*

*Jer-Junn Luh (National Taiwan University, Taiwan)*

*Wen-Shiang Chen (National Taiwan University Hospital, Taiwan)*

*Liang-Wey Chang (National Taiwan University, Taiwan)*

*Tyng-Guey Wang (National Taiwan University Hospital, Taiwan)*



### **Effects of Regent Suit on Lower Limb Electromyographic Patterns**

*Giovanni D'Addio (S. Maugeri Foundation, Italy)*

*Francesco Lullo (S. Maugeri Foundation, Italy)*

*Fernanda Gallo (S. Maugeri Foundation, Italy)*

*Bernardo Lanzillo (S. Maugeri Foundation, Italy)*

*Nicola Pappone (S. Maugeri Foundation, Italy)*

*Isabella Springhetti (S. Maugeri Foundation, Italy)*

*Mario Cesarelli (University of Naples Federico II, Italy)*

### **Relationships of Kinematics Indexes with Amplitude and Velocity of Upper Arm Reaching Movement**

*Giovanni D'Addio (S. Maugeri Foundation, Italy)*

*Nicola Pappone (S. Maugeri Foundation, Italy)*

*Maria Romano (University of Naples Federico II, Italy)*

*Francesco Lullo (S. Maugeri Foundation, Italy)*

*Paolo Bifulco (University of Naples Federico II, Italy)*

*Luigi Iuppariello (University of Naples Federico II, Italy)*

*Mario Cesarelli (University of Naples Federico II, Italy)*

**13:30 - 15:10**

### **Smart Home Applications and Home Automation**

**Chair:** *Emil M. Petriu (University of Ottawa, Canada)*

**Room:** C0420

#### **13:30 Dual Architecture Platform for Unobtrusive Wheelchair User Monitoring**

*Eduardo C Pinheiro (Instituto Superior Tecnico & Instituto de Telecomunicações, Portugal)*

*Octavian Adrian Postolache (Instituto de Telecomunicações, Lisboa/IT & Instituto Universitario de Lisboa, ISCTE-IUL, Portugal)*

*Pedro Girão (Institute of Telecommunications (IT), Portugal)*

#### **13:50 Bed occupancy measurements using under mattress pressure sensors for long term patient monitoring of community-dwelling older adults**

*Matthew Taylor (Carleton University, Canada)*

*Theresa L Grant (Bruyere Research Institute & University of Ottawa, Canada)*

*Frank Knoefel (Bruyere Continuing Care, Canada)*

*Rafik Goubran (Carleton University, Canada)*

#### **14:10 Monitoring the Relief of Pressure Points for Pressure Ulcer Prevention: A Subject Dependent Approach**

*Stephanie Bennett (Carleton University, Canada)*

*Rafik Goubran (Carleton University, Canada)*

*Kenneth Rockwood (Dalhousie University, Canada)*

*Frank Knoefel (Bruyere Continuing Care, Canada)*

#### **14:30 Dynamic Sign Language and Voice Recognition for Smart Home Interactive Application**

*Muhammad R Abid (University of Ottawa, Canada)*

*Lidia Santiago Melo (Military Institute of Engineering & University of Ottawa, Canada)*

*Emil M. Petriu (University of Ottawa, Canada)*

#### **14:50 Biology-Inspired Artificial Neural Network Solutions for Android Control**

*Emil M. Petriu (University of Ottawa, Canada)*

*Ana-Maria Cretu (Université du Québec en Outaouais, Canada)*

**13:30 - 15:10**

**Physiological Measurements and Processing I**

**Chair:** *Domenico Grimaldi (University of Calabria, Italy)*

**Room:** C0422

**13:30 Physiological unbalance during dry static apneas**

*Florian Thürk (Vienna University of Technology, Austria)*

*Eugenijus Kaniusas (Vienna University of Technology, Austria)*

**13:50 Impact of Motion Artifacts on Heart Rate Variability Measurements and Classification Performance**

*Jelena Nikolic-Popovic (Carleton University, Canada)*

*Rafik Goubran (Carleton University, Canada)*

**14:10 Differentiating Two Daily Activities Through Analysis of Short Ambulatory Video Clips**

*Payam Moradshahi (Carleton University, Canada)*

*James R Green (Carleton University, Canada)*

*Edward Lemaire (University of Ottawa, Canada)*

*Natalie Baddour (University of Ottawa, Canada)*

**14:30 Cognitive Change Measurement Through Driving Navigation Ability Sensing and Analysis**

*Bruce Wallace (Carleton University, Canada)*

*Rafik Goubran (Carleton University, Canada)*

*Frank Knoefel (Bruyere Continuing Care, Canada)*

**14:50 Photoplethysmogram-based Blood Pressure Evaluation using Kalman Filtering and Neural Networks**

*Yuriy Kurylyak (University of Calabria, Italy)*

*Kurt Barbé (Vrije Universiteit Brussel, Belgium)*

*Francesco Lamonaca (University of Calabria, Italy)*

*Domenico Grimaldi (University of Calabria, Italy)*

*Wendy Van Moer (Vrije Universiteit Brussel, Belgium)*

**15:10 - 15:30 Afternoon Break**

**15:30 - 16:50**

**Sensors for Medical Systems and Biomaterials I**

**Chair:** *Sergio Rapuano (University of Sannio, Italy)*

**Room:** C0420

**15:30 Concentration Detection in Water-Glucose Mixtures for Medical Applications Using Ultrasonic Velocity**

*Udo Schwerthoefter (University of Erlangen-Nuremberg, Germany)*

*M. Winter (University of Erlangen-Nuremberg, Germany)*

*R. Weigel (University of Erlangen-Nuremberg, Germany)*

*D. Kissinger (University of Erlangen-Nuremberg, Germany)*

**15:50 A Fast Quench-Reset Integrated Circuit for High-Speed Single Photon Detection**

*Marzieh Ameri (Polytechnique Montreal, Canada)*

*Ehsan Kamrani (Polytechnique Montreal, Canada)*

*Saeid Hashemi (Polytechnique Montreal, Canada)*

*Mohamad Sawan (Polytechnique Montreal, Canada)*

- 16:10 Effect of lateral motion of ultrasonic probe on measurement accuracy of internal tissue displacement**  
*Andy Huang (Carleton University, Canada)*  
*Yuu Ono (Carleton University, Canada)*  
*Andy Adler (Carleton University, Canada)*
- 16:30 Modeling and Simulation of Solar Boost Converter to Supply Power for Cardiac Pacemakers**  
*Munna Khan (Jamia Millia Islamia, New Delhi, India)*  
*Ajai Kumar Singh (Jamia Millia Islamia, New Delhi, India)*
- 15:30 - 17:10**  
**Physiological Measurements and Processing II**  
**Chair:** *Adrian D.C. Chan (Carleton University, Canada)*  
**Room:** *Room C0422*
- 15:30 Alveolar pressure estimation in total liquid ventilation during pauses impeded by tube resonance**  
*Jonathan Vandamme (Université de Sherbrooke, Canada)*  
*Raymond Robert (Université de Sherbrooke, Canada)*  
*Philippe Micheau (Université de Sherbrooke, Canada)*  
*Florine Weil (Institut Polytechnique de Bordeaux, France)*  
*Pamela-Samanta Germin (Université de Sherbrooke, Canada)*  
*Olivier Avoine (Université de Sherbrooke, Canada)*  
*Jean-Paul Praud (Université de Sherbrooke, Canada)*
- 15:50 Biosignal Quality Analysis of Surface EMG using a Correlation Coefficient Test for Normality**  
*Graham Fraser (Carleton University, Canada)*  
*Adrian D.C. Chan (Carleton University, Canada)*  
*James R Green (Carleton University, Canada)*  
*Dawn T. MacIsaac (University of New Brunswick, Canada)*
- 16:10 A Mathematical Model for Personalized Relaxation for Stress Management**  
*Mohamad Eid (University of Ottawa, Canada)*  
*Hussein Al Osman (University of Ottawa, Canada)*  
*Abdulmoteleb El Saddik (University of Ottawa, Canada)*
- 16:30 Multi-channel architecture for evaluation of automated oscillometric blood pressure devices**  
*Octavian Adrian Postolache (Instituto de Telecomunicações, Lisboa/IT & Instituto Universitario de Lisboa, ISCTE-IUL, Portugal)*  
*Pedro Girão (Institute of Telecommunications (IT), Portugal)*  
*Gabriela Postolache (Universidade Atlantica, Portugal)*
- 16:50 New Sampling Approach for Wireless ECG Systems with Compressed Sensing Theory**  
*Mohammadreza Balouchestani (Ryerson University, Canada)*  
*Kaamran Raahemifar (Ryerson University, Canada)*  
*Sridhar Krishnan (Ryerson University, Canada)*
- 19:00 - 22:00 Gala Dinner**

## Sunday, May 5

08:50 - 10:30

### Neural Signal Processing and Applications

Chair: Rafik Goubran (Carleton University, Canada)

Room: C0420

#### 08:50 Automatic Detection and Spatial Clustering of Interictal Discharges in Invasive Recordings

*Radek Janca (Czech Technical University in Prague, Czech Republic)*

*Petr Jezdik (Czech Technical University in Prague, Czech Republic)*

*Roman Cmejla (Czech Technical University in Prague, Czech Republic)*

*Pavel Krsek (Charles University in Prague, Czech Republic)*

*John Godon Ralph Jefferys (University of Birmingham, United Kingdom)*

*Petr Marusic (University Hospital Motol, Prague, Czech Republic)*

*Premysl Jiruska (Academy of Sciences of Czech Republic, Prague, Czech Republic)*

#### 09:10 Preprocessing fMRI data under correct Rice conditions

*Lieve Lauwers (Vrije Universiteit Brussel, Belgium)*

*Kurt Barbé (Vrije Universiteit Brussel, Belgium)*

*Wendy Van Moer (Vrije Universiteit Brussel, Belgium)*

#### 09:30 Automatic Detection of High-frequency Oscillations in Invasive Recordings

*Tomas Havel (Czech Technical University in Prague, Czech Republic)*

*Radek Janca (Czech Technical University in Prague, Czech Republic)*

*Petr Jezdik (Czech Technical University in Prague, Czech Republic)*

*Roman Cmejla (Czech Technical University in Prague, Czech Republic)*

*Pavel Krsek (Charles University in Prague, Czech Republic)*

*John Godon Ralph Jefferys (University of Birmingham, United Kingdom)*

*Petr Marusic (University Hospital Motol, Prague, Czech Republic)*

*Premysl Jiruska (Academy of Sciences of Czech Republic, Prague, Czech Republic)*

#### 09:50 Measurements of Rat Brain Activity Originating From Ultrasound Waves in Air

*Antonino Secondo Fiorillo (University Magna Graecia of Catanzaro, Italy)*

*Salvatore Andrea Pullano (University Magna Graecia of Catanzaro, Italy)*

*Costantino Davide Critello (University Magna Graecia of Catanzaro, Italy)*

*Rita Citraro (University Magna Graecia of Catanzaro, Italy)*

*Giovambattista De Sarro (University Magna Graecia of Catanzaro, Italy)*

*Emilio Russo (University Magna Graecia of Catanzaro, Italy)*

#### 10:10 Multidimensional Analysis of EEG Features using Advanced Spectral Estimates for Diagnosis Accuracy

*Aime' Lay-Ekuakille (University of Salento, Italy)*

*Patrizia Vergallo (University of Salento, Italy)*

*Giuseppe Griffò (University of Salento, Italy)*

*Francesco Conversano (National Council of Research, Institute of Clinical Physiology, Lecce, Italy)*

*Sergio Casciari (National Council of Research, Institute of Clinical Physiology, Lecce, Italy)*

*Shabana Urooj (Gautam Buddha University, India)*

*Vikrant Bhateja (Shri Ramswaroop Memorial Group of Professional Colleges, Lucknow, India)*

*Antonio Trabacca (IRCCS Eugenia Medea, Associazione La Nostra Famiglia, BRINDISI - ITALY, Italy)*

**08:50 - 10:30**

**Rehabilitation I**

**Chair:** Miodrag Bolić (University of Ottawa, Canada)

**Room:** C0422

**08:50      Characteristics of a Dual Force Plate System Embedded in a Six Degree of Freedom Motion Platform**

*Emily Sinitski (The Ottawa Hospital Research Institute, Canada)*

*Edward Lemaire (University of Ottawa, Canada)*

*Natalie Baddour (University of Ottawa, Canada)*

**09:10      Neural Network-based Angular Position Estimation Using EMG Signals during a Leg Extension Task**

*Irving Cifuentes-Gonzalez (INAOE, Mexico)*

*Juan Ramirez-Cortes (INAOE, Mexico)*

*Jose J. Rangel-Magdaleno (INAOE, Mexico)*

*Ruben Alejos-Palomares (UDLAP, Mexico)*

*Silvia Conforto (University Roma Tre, Italy)*

**09:30      A Novel Measurement Device for Volume Management in Lower Limb Amputees: A Technical Note**

*David Swartzendruber, Jr (University of Washington, USA)*

*Morgan Redfield (University of Washington, USA)*

*Joan Sanders (University of Washington, USA)*

**09:50      Measurement of *in-vivo* Patella Kinematics Using Motion Analysis and Ultrasound (MAUS)**

*Andrew Monk (University of Oxford, United Kingdom)*

*Minsi Chen (University of Derby, United Kingdom)*

*Stephen Mellon (University of Oxford, United Kingdom)*

*Christopher Gibbons (Nuffield Orthopaedic Centre, United Kingdom)*

*David Beard (University of Oxford, United Kingdom)*

*Harinderjit Gill (University of Bath, United Kingdom)*

*David Murray (University of Oxford, United Kingdom)*

**10:10      A sensing chair design for home based physiological signs monitoring**

*Guifeng Jia (Zhejiang University, P.R. China)*

*Jie Zhou (Zhejiang University, P.R. China)*

*Pan Yang (Zhejiang University, P.R. China)*

*Qing Pan (Zhejiang University, P.R. China)*

*Xiao Fu (Zhejiang University, P.R. China)*

*Xia Cao (Hangzhou Dianzi University, P.R. China)*

*Hua Hu (Hangzhou Dianzi University, P.R. China)*

*Gangmin Ning (Zhejiang University, P.R. China)*

**10:30 - 10:50      Morning Break**

**10:50 - 12:10**

**Sensors for Medical Systems and Biomaterials II**

**Chair:** Octavian Adrian Postolache (*Instituto de Telecomunicações, Lisboa/IT & Instituto Universitario de Lisboa, ISCTE-IUL, Portugal*)

**Room:** C0420

**10:50 Temperature and Measurement Changes over Time for F-Scan Sensors**

*Andrew Herbert-Copley (University of Ottawa, Canada)*

*Emily Sinitzki (The Ottawa Hospital Research Institute, Canada)*

*Edward Lemaire (University of Ottawa, Canada)*

*Natalie Baddour (University of Ottawa, Canada)*

**11:10 Design of a Wearable Sweat Sensor for Diagnosing Cystic Fibrosis in Children**

*Rosario Morello (University Mediterranea of Reggio Calabria, Italy)*

*Aime' Lay-Ekuakille (University of Salento, Italy)*

*Claudio De Capua (University Mediterranea of Reggio Calabria, Italy)*

*Giuseppe Griffò (University of Salento, Italy)*

*Maria Carla Lugarà (University Mediterranea of Reggio Calabria, Italy)*

*Patrizia Vergallo (University of Salento, Italy)*

**11:30 An Efficient Time-Based CMOS Potentiostat for Neurotransmitters Sensing**

*Genevieve Massicotte (Ecole Polytechnique Montreal & Polystim*

*Neurotechnologies, Canada)*

*Sawan Mohamad (Ecole Polytechnique de Montreal, Canada)*

**11:50 An Implantable Micropump Prototype for Focal Drug Delivery**

*Ali Hamie (Ecole Polytechnique, Canada)*

*Ebrahim Ghafar-Zadeh (Ecole Polytechnique, Canada)*

*Mohamad Sawan (École Polytechnique de Montréal, Canada)*

**10:50 - 12:10**

**Rehabilitation II**

**Chair:** Pasquale Daponte (*University of Sannio, Italy*)

**Room:** C0422

**10:50 A Wireless-based Home Rehabilitation System for Monitoring 3D Movements**

*Pasquale Daponte (University of Sannio, Italy)*

*Luca De Vito (University of Sannio, Italy)*

*Carmine Sementa (University of Sannio, Italy)*

**11:10 Validation of a home rehabilitation system for range of motion measurements of limb functions**

*Pasquale Daponte (University of Sannio, Italy)*

*Luca De Vito (University of Sannio, Italy)*

*Carmine Sementa (University of Sannio, Italy)*

**11:30 KINECT applications for the physical rehabilitation**

*Noofumi Kitsunezaki (Aoyama Gakuin University, Japan)*

*Eijiro Adachi (Kitasato University, Japan)*

*Takashi Masuda (Kitasato University, Japan)*

*Jun-ichi Mizusawa (TeleBusiness Inc., Japan)*

**11:50 Anytime Sport Activity Risk Level Calculation Using HOSVD based Hierarchical Fuzzy Models**

*Edit Tóth-Laufer (Obuda University, Hungary)*

*Annamaria R. Varkonyi-Koczy (Obuda University, Hungary)*

**12:10 - 13:30**      **Lunch**

**13:30 - 14:50**

**Electrode Design and Systems Based on Electrodes**

**Chair:** Voicu Groza (*University of Ottawa, Canada*)

**Room:** C0420

**13:30      Dry and Flexible Elastomer Electrodes Outperform Similar Hydrogel and Ag/AgCl Electrodes**

*Tomasz A. Kosierkiewicz (2605 Main Street & Mount Vernon Neurology, USA)*

**13:50      An ECG Monitoring System Using Conductive Fabric**

*Bahareh Taji (Isfahan University of Technology, Iran)*

*Shervin Shirmohammadi (University of Ottawa, Canada)*

*Voicu Groza (University of Ottawa, Canada)*

*Miodrag Bolić (University of Ottawa, Canada)*

**14:10      The MouthPad: a Tongue-Computer Interface**

*Ovidiu Draghici (University of Ottawa, Canada)*

*Izmail Batkin (University of Ottawa, Canada)*

*Ian Chapman (NorDocs Technologies, Canada)*

*Miodrag Bolić (University of Ottawa, Canada)*

**14:30      Superabsorbent Polymer Electrode for Transcranial Direct Current Stimulation**

*Herschel Caytak (University of Ottawa, Canada)*

*Izmail Batkin (University of Ottawa, Canada)*

*Abeye Mekonnen (University of Ottawa, Canada)*

*Daniel Shapiro (University of Ottawa, Canada)*

*Scott Hassoun (University of Ottawa, Canada)*

*Glenn Li (McGill University, Canada)*

*Hilmi R Dajani (University of Ottawa, Canada)*

*Miodrag Bolic (University of Ottawa, Canada)*

**14:50      Wearable Biopotential Measurement Using the TI ADS1198 Analog Front-End and Textile Electrodes**

*Helder Carvalho (Universidade de Minho, Portugal)*

*Andre Catarino (Universidade de Minho, Portugal)*

*Octavian Adrian Postolache (Instituto de Telecomunicações, Lisboa/IT & Instituto*

*Universitario de Lisboa, ISCTE-IUL, Portugal)*

*Tiago Pereira (Universidade de Minho, Portugal)*

*Maria Dias (Universidade de Minho, Portugal)*

*Pedro Girão (Institute of Telecommunications (IT), Portugal)*

**13:30 - 15:10**

**IT in Medicine and Testing and Calibration**

**Chair:** *Luca De Vito (University of Sannio, Italy)*

**Room:** *C0422*

- 13:30**     **Traceability Proposal in Calibration of Electrosurgery Equipment**  
*German Gomez (INTI, Argentina)*
- 13:50**     **An Automated Test System for Measuring and Improving Electrosurgical Effects**  
*Anup Amin (COVIDIEN, USA)*  
*Daniel Friedrichs (COVIDIEN, USA)*  
*Robert Lathrop (University of Cincinnati, USA)*  
*Carolyn Ford (COVIDIEN, USA)*  
*Eric Larson (COVIDIEN, USA)*  
*James Gilbert (COVIDIEN, USA)*
- 14:10**     **Toward a Context Awareness Framework for Healthcare Applications**  
*Mira Vrbaski (Carleton University, Canada)*  
*Dorina C Petriu (Carleton University, Canada)*
- 14:30**     **Operating System Performance Measurements for Remote Patient Monitoring Applications**  
*Vilas Joshi (Carleton University, Canada)*  
*Payam Moradshahi (Carleton University, Canada)*  
*Rafik Goubran (Carleton University, Canada)*
- 14:50**     **A Crowdsourcing Web Platform - Hip Joint Segmentation by Non-Expert Contributors**  
*Alberto Chávez-Aragón (University of Ottawa, Canada)*  
*Won-Sook Lee (University of Ottawa, Canada)*  
*Aseem Vyas (University of Ottawa, Canada)*

**15:10 - 15:30**

**Plenary Closing Session**

**Room:** *Grand Salle*