

2008 IEEE International Workshop on Medical Measurements and Applications

**Ottawa, ON, Canada
9-10 May 2008**



**IEEE Catalog Number:
ISBN 13:**

**CFP08MEA-PRT
978-1-4244-1937-1**

TABLE OF CONTENTS

MESSAGE FROM THE CHAIRMEN	vii
KEYNOTE ADDRESS	viii
MeMeA 2008 TECHNICAL PROGRAM COMMITTEE	ix
MeMeA 2008 TECHNICAL PROGRAM TRACKS AND SESSIONS	1
<u>Friday, May 9</u>	
Session FR-1: Standards and medical applications I	
Dr. Wahab Almuhtadi, Chair of IEEE Ottawa Section	
<i>Hand-Gesture and Facial-Expression Human-Computer Interfaces for Intelligent Space Applications</i>	1
Qing Chen (University of Ottawa, Canada)	
Marius Cordea (University of Ottawa, Canada)	
Emil Petriu (University of Ottawa, Canada)	
Thomas Whalen (CRC, Canada)	
Imre Rudas (Budapest Tech Polytechnic Institution, Hungary)	
Annamaria Varkonyi-Koczy (Budapest University of Technology and Economics, Hungary)	
<i>Precise Recognition of Complicated hand Operations Based on EEG and Master-Slave Neural Network</i>	7
Xiaodong Zhang (Northwestern Polytechnical University, P.R. China)	
Hyouk Choi (Sungkyunkwan University, Korea)	
<i>Haptic Rehabilitation Exercises Performance Evaluation Using Fuzzy Inference Systems</i>	13
Ahmad Barghout (University of Ottawa, Canada)	
Atif Alamri (University of Ottawa, Canada)	
Mohamad Eid (University of Ottawa, Canada)	
Abdulmotaleb El Saddik (University of Ottawa, Canada)	
<i>Comparative Analysis of Tactile Sensitivity Between Blind, Deaf and Unimpaired People</i>	19
Ilton Barbacena (Federal Center of Technological Education of Paraíba, Brazil)	
Ana Lima (Research and Technological Innovation, Brazil)	
Aléssio Barros (Federal University of Campina Grande, Brazil)	
Raimundo Freire (Federal University of Campina Grande, Brazil)	
José Pereira (Federal University of Amazonas, Brazil)	
<i>Rapid Ball-and-Socket Joint Collision Detection</i>	25
Ding Cai (University of Ottawa, Canada)	
WonSook Lee (University of Ottawa, Canada)	
Chris Joslin (CarltonUniversity, Canada)	
<i>MRI Image Enhancement by PROPELLER Data Fusion</i>	29
Krzysztof Malczewski (Poznan University of Technology, Poland)	

Session FR-2: Embedded systems and signal processing

Chair: Mart Min, Tallinn University of Technology, Estonia

<i>Development of a Bed Sensor for an Integrated Digital Home Monitoring System</i>	33
Anuroop Gaddam (Massey University, New Zealand)	
Subhas Mukhopadhyay (Massey University, New Zealand)	
Gourab Sen Gupta (Massey University, New Zealand)	
<i>Health Status Monitor Based on Embedded Photoplethysmography and Smart Phone</i>	39
Octavian Postolache (Instituto de Telecomunicações/DEEC-IST, Portugal)	
Pedro Silva Girão (Instituto de Telecomunicações/DEEC-IST, Portugal)	
P. Sinha (Indian Institute of Technology, India)	
A. Anand (Indian Institute of Technology, India)	
G. Postolache (Universidade Atlântica, Portugal)	
<i>Characterization and Design of EEG Classifier: Uncertainty and Modeling</i>	44
Aime' Lay-Ekuakille (University of Salento, Italy)	
Giuseppe Vendramin (University of Salento, Italy)	
Amerigo Trotta (Polytechnic of Bari, Italy)	
Marta De Rinaldis (Scientific Institute for Research, Hospitalization and Healthcare - IRCCS, Italy)	
Antonio Trabacca (Scientific Institute for Research, Hospitalization and Healthcare - IRCCS, Italy)	
<i>An Adaptively Tunable Model of the Cardiac Signal for the Bio-Impedance Signal Decomposer (BISD)</i>	49
Andrei Krivoshei (Tallinn University of Technology, Estonia)	
Vello Kukk (Tallinn University of Technology, Estonia)	
Mart Min (Tallinn University of Technology, Estonia)	
<i>Full range Complex Fourier Domain Optical Coherence Tomography based on a Quadrature Mach-Zehnder Interferometer</i>	53
Costel Flueraru (National Research Council, Canada)	
Youxin Mao (National Research Council, Canada)	
Sherif Sherif (National Research Council, Canada)	
Shoude Chang (National Research Council, Canada)	
<i>Nasal cycle analysis with the use of acoustic rhinometry</i>	56
Piotr Boguski (Warsaw University of Technology, Poland)	
Antoni Grzanka (Warsaw University of Technology, Poland)	
<i>Search for abnormal thermal patterns in clinical thermal infrared imaging</i>	61
Christophe Herry (Carleton University, Canada)	
Monique Frize (Carleton University/University of Ottawa, Canada)	
Rafik Goubran (Carleton University, Canada)	

Session FR-3 Sensors for medical systems and medical specific instrumentation I

Chair: Sreeraman Rajan, Defence Research and Development Canada

<i>Towards the development of an Integrated Sensing System for Health Monitoring</i>	66
Subhas Mukhopadhyay (Massey University, New Zealand)	
Gourab Sen Gupta (Massey University, New Zealand)	
<i>Breathing Signal Fusion in Pressure Sensor Arrays</i>	71
Megan Holtzman (Carleton University, Canada)	
Amaya Arcelus (Carleton University, Canada)	
Rafik Goubran (Carleton University, Canada)	
Frank Knoefel (Elisabeth-Bruyere Research Institute/University of Ottawa, Canada)	

<i>Toward Fully Integrated CMOS Based Capacitive Sensor Lab-on-Chip Applications</i>	77
Ebrahim Ghafar-Zadeh (Polytechnique de Montreal, Canada)	
Mohamad Sawan (Polytechnique de Montreal, Canada)	
<i>Detection of unreliable measurements in multi-sensor devices</i>	81
Yednek Asfaw (University of Ottawa, Canada)	
Andy Adler (Carleton University, Canada)	
<i>Discrimination of Inconsistencies in Medical Data</i>	87
Jeff Gilchrist (Carleton University, Canada)	
Daphne Townsend (Carleton University, Canada)	
Colleen Ennett (Philips Research North America, USA)	
Monique Frize (Carleton University/University of Ottawa, Canada)	
Erika Bariciak (Children's Hospital of Eastern Ontario, Canada)	

Saturday, May 10

Session SA-1 Sensors for medical systems and medical specific instrumentation II

Chair: Octavian Postolache, Instituto de Telecomunicações, Portugal

<i>Continuous Wireless Monitoring of the Cervical Dilatation of a Pregnant Woman</i>	93
Pramode Verma (University of Oklahoma, USA)	
Anjan Ghosh (University of Oklahoma, USA)	
Robert Huck (University of Oklahoma, USA)	
Samuel Cheng (University of Oklahoma, USA)	
Shanshan Chen (University of Oklahoma, USA)	
Mark Martens (Planned Parenthood of Arkansas and Eastern Oklahoma, Inc, USA)	
Anil Kaul (Oklahoma State University, USA)	
<i>Smart Rollator Prototype</i>	97
Adrian Chan (Carleton University, Canada)	
James Green (Carleton University, Canada)	
<i>A 3D Scanning System for Biomedical Purposes Using the Laser Light-sectioning Method and Elliptical Fourier Descriptors</i>	101
Beverly Bradley (Carleton University, Canada)	
Adrian Chan (Carleton University, Canada)	
M. John D. Hayes (Carleton University, Canada)	
<i>Study of Gall Bladder Stones as a New Piezoelectric Sensor Material</i>	106
Vedram Singh (National Physical Laboratory, India)	
<i>Measurement of Progress for Haptic Motor Rehabilitation Patients</i>	108
Ruba Kayyali (University of Ottawa, Canada)	
Shervin Shirmohammadi (University of Ottawa, Canada)	
Abdulmotaleb El Saddik (University of Ottawa, Canada)	

Session SA-2: Standards and medical applications II

Chair: Miodrag Bolic, University of Ottawa, Canada

Reduction of Doubtful Detection of Human Lymphocyte Micro-Nucleus based on Wiener's Deconvolution and Computing Distributed Service 114
Domenico Grimaldi (University of Calabria, Italy)
Francesco Lamonaca (University of Calabria, Italy)
Carmelo Macri (University of Calabria, Italy)

The Measurement of Blood Pressure During Sleep..... 120
Hilmi Dajani (University of Ottawa, Canada)
Richard Leung (St. Michael's Hospital, University of Toronto, Canada)

Automated Non-Invasive Measurement of Blood Pressure: Standardization of Calibration Procedures 124
Eulalia Balestrieri (University of Sannio, Italy)
Pasquale Daponte (University of Sannio, Italy)
Sergio Rapuano (University of Sannio, Italy)

Standardizing blood pressure measurement – is it possible? 129
Radu Leca (Biosign Technologies Inc, Canada)
Voicu Groza (University of Ottawa, Canada)