2014 IEEE 16th International Conference on e-Health Networking, Applications and Services

(Healthcom 2014)

Natal-RN, Brazil
15-18 October 2014
IWEN14: International Workshop on e-health in Neurosciences

The workshop in "e-health in Neurosciences" aims at bringing together prominent researchers in this field creating a place to exchange the latest research achievements and experiences. The ongoing inclusion of new technologies such as virtual reality, wearable sensors and actuators, brain-computer interfaces, biosensors, etc., have to be accompanied by a high level debate by the scientific community and society.

Transcranial Direct Current Stimulation to Enhance Motor Function in Spinal Cord Injury: Pilot Data

Elizabeth Salmon and Cheryl Carrico (University of Kentucky, USA); Laurie Nichols (University of Kentucky & Cardinal Hill Rehabilitation Hospital, USA); Lakshmi Reddy and Sara Salles (University of Kentucky, USA); Lumy Sawaki (University of Kentucky & Cardinal Hill Rehabilitation Hospital, USA)

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Dose-Response Effects of Peripheral Nerve Stimulation and Motor Training in Stroke: Preliminary Data

Emily Salyers, Cheryl Carrico and Kenneth Chelette (University of Kentucky, USA); Laurie Nichols (University of Kentucky & Cardinal Hill Rehabilitation Hospital, USA); Cameron Henzman (University of Kentucky, USA); Lumy Sawaki (University of Kentucky & Cardinal Hill Rehabilitation Hospital, USA)

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Effects of Electrode Configurations in Transcranial Direct Current Stimulation after Stroke

Kenneth Chelette and Cheryl Carrico (University of Kentucky, USA); Laurie Nichols (University of Kentucky & Cardinal Hill Rehabilitation Hospital, USA); Emily Salyers (University of Kentucky, USA); Lumy Sawaki (University of Kentucky & Cardinal Hill Rehabilitation Hospital, USA)

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c-Fos immunoreactivity and variation of neuronal units in rat’s motor cortex after chronic implants

Marco Aurelio M Freire (Edmond and Lily Safra International Institute for Neurosciences of Natal, Brazil); Jean Faber (Federal University of São Paulo, Brazil); Jose Ronaldo Santos (Federal University of Sergipe, Brazil); Nelson Lemos (Edmond and Lily Safra International Institute for Neuroscience of Natal, Brazil); Maria Adelia Aratanha (Edmond and Lily Safra International Institute of Neuroscience of Natal, Brazil); Pedro Cavalcanti (Edmond and Lily Safra International Institute for Neurosciences of Natal, Brazil); Edgard Morya (Edmond and Lily Safra International Institute for Neuroscience of Natal, Brazil)

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Limitations of principal component analysis as a method to detect neuronal assemblies

Camila Sardeto Deolindo and Ana Bione Kunicki (Edmond and Lily Safra International Institute of Neuroscience of Natal, Brazil); Fabricio Lima Brasil (IINN-ELS, Brazil); Renan Moioli (Edmond and Lily Safra International Institute of Neuroscience of Natal & Graduate School of Neuroengineering, Brazil)

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ReHis14: The 1st International Workshop on Reliability of eHealth Information Systems

The progressive evolution of eHealth Information System requirements

ReHis14.1 How Should Remote Monitoring Sensor Be Accurate?

Seiki Tokunaga, Shinsuke Matsumoto, Sächtio Saiki and Masahide Nakamura (Kobe University, Japan)

pp. 31-36
Technological developments in computing and networking have largely made the delivery of health services, including medical diagnosis and patient care, possible from a distance. Many funded projects have evaluated and are evaluating the use of communications technology in the implementation and performance of telemedicine activities, and examined the impact of telemedicine on medical care in terms of cost, quality, and access. Telemedicine has become a growing new interdisciplinary field, which will eventually contribute to improving the quality of health care for everyone. However, successful implementation of this vision depends not only on innovative telemedicine applications but also on networking and computing technical readiness. Furthermore, many ethical, social, and political problems arising in telemedicine need technical solutions.

**QuoTe - An Extensible Platform for QoE Monitoring and Benchmarking of Telemedicine Applications**  
Martin Varela, Toni Mäki and Juho Merilahti (VTT Technical Research Centre of Finland, Finland); Eva Rodriguez Rodriguez and Arnaud Runge (European Space Agency, The Netherlands)  
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**Big Data Reduction Using RBFNN: A Predictive Model for ECG Waveform for eHealth platform integration**  
Nuno Pombo (University of Beira Interior & BSAFE - Lab, Portugal); Nuno M. Garcia (Universidade da Beira Interior & Instituto de Telecomunicações, Universidade Lusófona de Humanidades e Tecnologias, Portugal); Virginie Felizardo and Kouamana Bousson (University of Beira Interior, Portugal)  
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**Quality evaluation of compressed 3D surgical video**  
Chaminda T. E.R. Hewage (University of Kingston, United Kingdom); Harsha Appuhami (Kingston University-London, United Kingdom); Maria G. Martini (Kingston University, United Kingdom); Ralph Smith (MATTU, United Kingdom); Timothy Rockall (Surrey University, United Kingdom); Iain Jourdan (MATTU, United Kingdom)  
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**Fuzzy Controller for Automatic Microphone Gain Control in an Autonomous Support System for Elderly**  
Luis E. Gonzalez, LG (Universidad Politecnica Salesiana, Ecuador); David Valencia-Redrovan and Vladimir Robles-Bykbaev, VRB (Universidad Politécnica Salesiana, Ecuador); Ninfa M Gonzalez (Turhuayco, Ecuador); Todd Panzner (New York, USA)  
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**Techno-economic evaluation of an ontology-based nurse call system via discrete event simulations**  
Frederic Vannieuwenborg and Femke Ongenae (Ghent University - iMinds, Belgium); Pieter Demytenaere and Laurens Van Poucke (Ghent University, Belgium); Jan Van Ooteghem (Ghent University, Belgium)  
pp. 82-86
Information security and privacy in the healthcare domain is a complex and challenging problem for computer scientists, social scientists, law experts and policy makers. Appropriate healthcare provision requires specialized knowledge, is information intensive and much patient information is of a particularly sensitive nature. Electronic health record systems provide opportunities for information sharing which may enhance healthcare services, for both individuals and populations. However, appropriate information management measures are essential for privacy preservation.

Traditional access control measures for privacy preservation may not match the eHealth record system scenario, where the roles of all stakeholders are less defined. Questions regarding data ownership and information management obligations for major stakeholders (healthcare professionals, patients, administrators) arise. Healthcare professionals require ready access to as much information as possible to support informed decision making. However, patients may want to exercise control over the entities gaining access to their personal health information, with particular concerns for information privacy. Balancing these competing concerns is a major challenge in the implementation of successful e-Health systems. This is not just a technological challenge, but a multidisciplinary problem with technological, social, legal and health policy aspects.

This workshop will focus on this major challenge in terms of these four main areas. We seek papers addressing the technological, socio-technical, legal and policy aspects related to information security and privacy issues in e-Health systems.

**SPAIMEh: 1st International Workshop on Secure and Privacy-Aware Information Management in eHealth**
Specialized telecommunications system in the transmission of digital radiological images in hostile environments
Leonardo Melo (Diagnext.com, Brazil); Alessandro Melo (Universidade Federal Fluminense, Brazil); Julio Cesar Julio Cesar R. Dal Bello (Federal Fluminense University, Brazil); Eduardo Vale (Universidade Federal Fluminense, Brazil)
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MobiCAP: A Mobile Application Prototype for Management of Community-Acquired Pneumonia
Daniel Welfer (Unipampa, Brazil); Renato Silva (Hospital Nossa Senhora da Conceição, Brazil); Juliano F. Kazienko (Universidade Federal do Pampa (UNIPAMPA), Brazil)
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Real time neural signal processing and visuomotor integration: new perspectives for assistive technology
Maria Adelia Aratanha (Edmond and Lily Safra International Institute of Neuroscience of Natal, Brazil); Hougelle Simplicio (Edmond and Lily Safra International Institute of Neuroscience of Natal & State University of Rio Grande do Norte, Brazil); Edgard Morya (Edmond and Lily Safra International Institute for Neuroscience of Natal, Brazil); Renan Moioli (Edmond and Lily Safra International Institute of Neuroscience of Natal & Graduate School of Neuroengineering, Brazil); Fabricio Lima Brasil (IINN-ELS, Brazil)
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**TS1: Body Area Networks (I)**

An Evaluation of Break-The-Glass Access Control Model for Medical Data in Wireless Sensor Networks
Htoo Aung Maw, Hannan Xiao, Bruce Christianson and James Malcolm (University of Hertfordshire, United Kingdom)
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Indoor Localization with Wearable RF devices in 868MHz and 2.4GHz Bands
Norbert Noury (University of Lyon & Team Biomedical Sensors, France); Julien Pouljaud and Fabien Touvat (Vigilio, France)
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Smart Data Synchronization in m-Health Monitoring Applications
Abdelghani Benharref (University of Wollongong, Australia); Mohamed Adel Serhani (Concordia University, Canada); Rabeb Mizouni (Khalifa University, UAE)
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Decode and Merge Cooperative MAC Protocol for intra WBAN Communication
Audace Manirabona (University of Sfax & University of Paris 13, France); Lamia Chaari Fourati (Institut supérieur d'informatique et multimédia de sfax, Tunisia); Saadi Boudjit (University of Paris 13, France)
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Post-diagnosis Management of Diabetes through a Mobile Health Consultation Application
Mechelle Gittens, Reco King and Curtis Gittens (University of the West Indies, Cave Hill, Barbados); Adrian Als (Supervisor, Jamaica)
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**TS2: eHealth for Aging**

A Quality of Context Evaluating Approach in an Ambient Assisted Living eHealth System
Debora Nazario, Jose Todesco, Mario Dantas and Igor Tromel (Federal University of Santa Catarina, Brazil); Augusto J. Venancio Neto (Federal University of Rio Grande do Norte & Centro de Ciências Exatas da Terra, Brazil); Rafael Andrade (Federal Institute Catarinense - Campus Ibirama, Brazil)
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Analysis of Visually Guided Tracking Performance in Parkinson's Disease
Yi Liu, Chonho Lee and Bu Sung Lee (Nanyang Technological University, Singapore); James Stevenson and Martin McKeown (University of British Columbia, Canada)
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**A Mobile Healthcare Solution for Ambient Assisted Living Environments**
Daniel Rodrigues, Edgar Horta, Bruno Silva, Fábio Guedes and Joel J. P. C. Rodrigues (Instituto de Telecomunicações, University of Beira Interior, Portugal)
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**Contribution of the cyclic correlation in gait analysis: variation between fallers and non-fallers**
Claude-Vivien Toulouse (University of Lyon & University Jean Monnet Saint-Etienne, LASPI - Roanne, France)
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**TS3: Electronic Health Records (I)**

**A Management System for Motion-Based Gaming Peripherals for Physical Therapy Instrumentation**
Benjamin Bockstege and Aaron D Striegel (University of Notre Dame, USA)
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**RESTful Services for an Innovative E-Health Infrastructure: A Real Case Study**
Fabio Vitali (Università di Bologna, Italy); Alessandro Amoroso and Marco Roccetti (University of Bologna, Italy); Gustavo Marfia (Università di Bologna, Italy)
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**A New Architecture for Secure Storage and Sharing of Health Records in the Cloud Using Federated Identity Attributes**
Lucas Silva (Universidade Federal do Pará, Brazil); Roberto Araujo (Universidade Federal do Para, Brazil); Felipe da Silva (Universidade Federal do Pará, Brazil); Eduardo Cerqueira (Federal University of Para & UCLA & UFPA & UCLA, Brazil)
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**A Social–Technological Alignment Matrix**
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**Towards A Cost-Effective Homecare for A Public Health Management System In Brazil**
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**TS4: Security and Privacy**

**Security Aspects of e-Health Systems Migration to the Cloud**
Antonis Michalas (Swedish Institute of Computer Science (SICS), Sweden); Nicolae Paladi (Swedish Institute of Computer Science & Lund University, Sweden); Christian Gehrmann (Swedish Institute of Computer Science, Sweden)
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**Identity Management in E-Health: A Case Study of Web of Things application using OpenID Connect**
Marlon C. Domenech (University of Vale do Itajaí, Brazil); Eros Comunello (University of Itajaí Valley & Programm on Applied Computing, Brazil); Michelle Silva Wangham (UNIVALI, Brazil)
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**Privacy preserving health data processing**
Anders Andersen, Kassaye Y. Yigzaw and Randi Karlsen (UIT The Arctic University of Norway, Norway)
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**A Network Security Architecture to Reduce the Risk of Data Leakage for Health Care Organizations**
Richard Rauscher (Dept. of Computer Science, Penn State University, USA); Raj Acharya (Dept. of Computer Science, Penn State University, India)
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**Detection of Nocturnal Epileptic Seizures Using Wireless 3-D Accelerometer Sensors**
Osman Salem, Yacine Rebhi, Abdelkrim Boumaza and Ahmed Mehaoua (University of Paris Descartes, France)
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**A Novel Vectorcardiogram System**
Gabriel Arrobo, Calvin Perumalla, Yang Liu, Thomas Ketterl, Richard D. Gitlin and Peter Fabri (University of South Florida, USA)
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Isao Nakajima (Tokai University School of Medicine, Japan); Toshihiko Kitano (Tokai University, Japan); Kaoru Nakada (Tokai University, Jordan); Jun-Ichi Hata (Tokai University, Japan); Masuhisa Ta (Tasada Works, Japan)
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**Low Complex, Programmable FPGA based 8-Channel Ultrasound Transmitter for Medical Imaging Researches**
Chandrashekar Dusa (IIT Hyderabad, India); Pachamuthu Rajalakshmi (Indian Institute of Technology Hyderabad, India); Suresh Puli and Uday B Desai (IIT Hyderabad, India); Shabbir N Merchant (IIT Bombay, India)
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**FPGA based Preliminary CAD for Kidney on IoT Enabled Portable Ultrasound Imaging System**
Konda Divya Krishna (IIT Hyderabad, India); Akkala Vivek and Pachamuthu Rajalakshmi (Indian Institute of Technology Hyderabad, India); Ramkrishna Bharath (Indian Institute of Technology, India); Abdul Mateen Mohammed (Asian Institute of Gastroentontology, India)
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**Ethical Assessment in E-Health**
Ai Keow Lim (Edinburgh Napier University, United Kingdom); Ioana Ispas (Ministry of National Education, Bucharest, Romania); Christoph P Thuemmler and Oli Mival (Edinburgh Napier University, United Kingdom); Eleni Kosta (Tilburg University, The Netherlands); Patricia Casla (IK4. Tekniker, Spain); Sonia Ruiz de Azua and Ana Gonzalez-Pinto (University of the Basque Country, Spain)
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**A mobile-based architecture for integrating personal health record data**
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**Medical Data Mining: a case study of a Paracoccidioidomycosis Patient's Database**
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Helber Ferreira (University of Rio Grande do Norte (UERN), Brazil); Harold Bustos (UERN, Brazil); Wilfredo Blanco (University of Rio Grande do Norte (UERN), Brazil)

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Jochen Meyer (OFFIS Institute for Information Technology, Germany); Susanne Christine Johanna Boll (University of Oldenburg & Department for Computing Science, Germany)

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Fletcher Lu (University of Ontario Institute of Technology, Canada)

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