

**2009 3rd International Conference
on Pervasive Computing
Technologies for Healthcare
(PERVASIVEHEALTH 2009)**

**London, United Kingdom
1 – 3 April 2009**



**IEEE Catalog Number: CFP0924C-PRT
ISBN: 978-963-9799-42-4**

TABLE OF CONTENTS

Recognising Activities of Daily Life through the Usage of Everyday Objects around the Home	1
<i>Usman Naeem, John Bigham</i>	
Intergenerational Communication Systems in Support for Elder Adults with Cognitive Decline	5
<i>Victoria Meza-Kubo, Alberto L. Moran, Marcela D. Rodríguez</i>	
A Framework for Physical Health Improvement using Wireless Sensor Networks and Gaming	9
<i>Paul Fergus, Kashif Kifayat, Simon Cooper, Madjid Merabti, Abdennour El Rhalibi</i>	
Pervasive Embedded Real Time Monitoring of EEG & SpO2	13
<i>Ajay M. Cheriyan, Zbigniew Kalbarczyk, Ravishankar K. Iyer, Albert O. Jarvi, Tanya M. Gallagher, Kenneth L. Watkin</i>	
Early Lessons from the Design of Tactile Terminals for Elderly People Do Older People Positively Consider Using Tactile Screens Combined with Rfid Tags to Manage Their Daily Activities?	17
<i>Otjacques Benoit, Krier Marc, Feltz Fernand, Gabriel Lippmann, Ferring Dieter, Hoffmann Martine</i>	
Technologies to Monitor Cognitive Decline A Preliminary Case Study	21
<i>Aleksandar Matic, Venet Osmani</i>	
Quality of Service for IEEE 802.15.4-based Wireless Body Sensor Networks	25
<i>Jose Javier Garcia, Thomas Falck</i>	
Body Area Network for Monitoring Autonomic Nervous System Responses	31
<i>L. Brown, B. Grundlehner, J. van de Molengraft, J. Penders, B. Gyselinckx</i>	
Customizing Sensor Nodes and Software for Individual Pervasive Health Applications	34
<i>Peter Langendoerfer, Frank Vater, Krzysztof Piotrowski</i>	
Performance Control in Wireless Sensor Networks	38
<i>Thomas Lindh, Ibrahim Orhan</i>	
Pervasive Wireless-Sensor-Networks for Home Healthcare Need Automatic Reasoning	42
<i>Davide Merico, Alessandra Mileo, Roberto Bisiani</i>	
An Overview of Development Problems in WSNs	46
<i>A. Prayati, F. Kerasiotis, C. Antonopoulos, S. Giannoulis, T. Stoyanova, G. Papadopoulos</i>	
A.M.O.R: An Adaptive Routing Mechanism for WSN Health Applications	50
<i>S. Giannoulis, A. Prayati, C. Antonopoulos, G. Papadopoulos</i>	
µSWN Interconnection to External Networks for Healthcare Applications	54
<i>Agnius Liutkevicius, Arunas Vrubliauskas, Egidijus Kazanavicius, Aggeliki Prayati</i>	
Performance Evaluation of a ZigBee-based Medical Sensor Network	58
<i>Helena Fernandez-Lopez, Pedro Macedo, Jose A., Afonso, J. H. Correia, Ricardo Simoes</i>	
A Wireless Network Scheme of Fetal Monitoring	62
<i>Ruoya Yao, Bing Liu, Xiaochen You, Wusun Chen</i>	
Smart-Clothing Wireless Flex Sensor Belt Network for Foetal Health Monitoring	66
<i>Luis M. Borges, Norberto Barroca, Fernando J. Velez, Antonio S. Lebres</i>	
Smart Pervasive Healthcare-Assistance in Daily Life	70
<i>Yuki Tamura, Masaaki Hashida, Shuji Sannomiya, Makoto Iwata</i>	
Feature Selection and Construction for the Discrimination of Neurodegenerative Diseases Based on Gait Analysis	76
<i>Mingjing Yang, Huiru Zheng, Haiying Wang, Sally McClean</i>	
A Context-aware Component for Identifying Risks associated to Elders' Activities of Daily Living	83
<i>Diana Saldana-Jimenez, Marcela D. Rodriguez, Adan-Noe Espinoza, Juan P. Garcia-Vazquez</i>	
Rule-based Activity Recognition Framework: Challenges, Technique and Learning	87
<i>Holger Storf, Martin Becker, Martin Riedl</i>	
Intelligent Context-Aware Monitoring of Hypertensive Patients	94
<i>Alessandro Copetti, Orlando Loques, J. C. B. Leite, Thais P. C. Barbosa, Antonio C. L. da Nobrega</i>	
Multimodal Platform for Communication, Training and Health Monitoring at Home	100
<i>J. Ruminski, T. Kocejko, A. Bujnowski, J. Wtorek</i>	
Wearable Wireless Ecg Monitoring Hardware Prototype for Use in Patients Own Home	105
<i>Jakob Justesen, Soren Christian Madsen</i>	
Trust Delegation for Medical Records Access using Public Mobile Networks	108
<i>Dasun Weerasinghe, Muttukrishnan Rajarajan, Veselin Rakocevic</i>	
Establishing Ethical Guidelines for Telehomecare Research on Chronic Diseases	115
<i>Y. Tony Yang</i>	

OpenCare Project: An Open, Flexible and Easily Extendible Infrastructure for Pervasive Healthcare Assisted Living Solutions	120
<i>Stefan Wagner, Claus Nielsen</i>	
OpenCare Project Personal Communication Device	130
<i>Stefan Wagner</i>	
Designing with Care	133
<i>Yvonne Schikhof, Ingrid Mulder, Martijn Vastenburg</i>	
User Acceptance in a Pervasive Care Platform	135
<i>Derboven J., Van Gils M., Agten S.</i>	
Keeping Everyone Happy: Multiple Stakeholder Requirements for Home Care Technology	137
<i>Marilyn Rose McGee-Lennon, Philip Gray</i>	
Designing Health Care Applications for the Deaf	140
<i>Paolo Prinetto, Gabriele Tiotto, Andrea Del Principe</i>	
Flexible Home Care Automation Adapting to the Personal and Evolving Needs and Situations of the Patient	142
<i>Mohammad Zarifi Eslami, Marten Van Sinderen</i>	
Putting the Patient at the Centre Making Telemedicine Services Personal Again	144
<i>Jan-Willem van 't Klooster, Bert-Jan van Beijnum, Hermie Hermens</i>	
Developing a Motion Language: Gait Analysis from Accelerometer Sensor Systems	146
<i>Anita Sant'Anna, Nicholas Wickstrom</i>	
Design and Testing of Lightweight Inexpensive Motion-Capture Devices with Application to Clinical Gait Analysis	154
<i>Eric Wade, Maja J Mataric</i>	
A Wireless System for Gait and Posture Analysis Based on Pressure Insoles and Inertial Measurement Units	161
<i>Marco Benocci, Laura Rocchi, Elisabetta Farella, Lorenzo Chiari, Luca Benini</i>	
Investigating the Potential of In-Home Devices for Improving Medication Adherence	167
<i>Young S. Lee, Joe Tullio, Nitya Narasimhan, Pallavi Kaushik, Jonathan R. Engelsma, Santosh Basapur</i>	
User Experiences of Mobile Wellness Applications in Health Promotion User Study of Wellness Diary, Mobile Coach and SelfRelax	175
<i>Aino Ahtinen, Elina Mattila, Antti Vaatanen, Lotta Hynninen, Jukka Salminen, Esa Koskinen, Klaus Laine</i>	
Flowie: A Persuasive Virtual Coach to Motivate Elderly Individuals to Walk	183
<i>Inaki Merino Albaina, Thomas Visser, Charles A.P.G. van der Mast, Martijn H. Vastenburg</i>	
Persuasion not Required Improving our Understanding of the Sociotechnical Context of Dietary Behavioural Change	190
<i>Julie Maitland, Matthew Chalmers, Katie A. Siek</i>	
A Home-Based Care Model for Outpatient Cardiac Rehabilitation Based on Mobile Technologies	198
<i>Antti Sarela, Ilkka Korhonen, Jukka Salminen, Esa Koskinen, Ole Kirkeby</i>	
A Design Framework for a Home-based Stroke Rehabilitation System: Identifying the Key Components	206
<i>Stefan Rennie Egglestone, Lesley Axelrod, Thomas Nind, Ruth Turk, Anna Wilkinson, Jane Burridge, Geraldine Fitzpatrick, Sue Mawson, Zoe Robertson, Ann Marie Hughes, Kher Hui Ng Will Pearson, Nour Shublaq, Penny Probert-Smith, Ian Rickets, Tom Rodden</i>	
Decision Support for Teletraining of COPD Patients	214
<i>Bianying Song, Klaus-Hendrik Wolf, Matthias Gietzelt, Osama Al Scharaa, Uwe Tegtbur, Reinhold Haux, Michael Marschollek</i>	
Gesture Therapy: a Clinical Evaluation	220
<i>L. Enrique Suar, Ariel Molina, Ronald Leder, Jorge Hernandez, Israel Sanchez</i>	
On the Design of Distributed Autonomous Embedded Systems for Biomedical Applications	225
<i>Jose Germano, Rui Ramalho, Leonel Sousa</i>	
Performance Analysis of an Activity Monitoring System using the SPINE Framework	233
<i>Roberta Giannantonio, Raffaele Gravina, Philip Kuryloski, Ville-Pekka Seppa, Fabio Bellifemine, Jari Hyttinen, Marco Sgroi</i>	
An Integrated Multi-Sensing Framework for Pervasive Healthcare Monitoring	241
<i>M. ElHelw, J. Pansiot, D. McIlwraith, R. Ali, B. Lo, L. Atallah</i>	
Realising Management and Composition of Self-Managed Cells in Pervasive Healthcare	248
<i>Alberto Schaeffer-Filho, Emil Lupu, Morris Sloman</i>	
A Wearable Passive Force Sensor Powered by an Active Interrogator Intended for Intra-splint Use for the Detection and Recording of Bruxism	256
<i>C. Gonzalez, A. Iiaz Lantada</i>	
Towards a Sustainable e-Health Deployment An Integrated Medical Information System for Sri Lankan Case	260
<i>G.G.D. Nishantha, Y. Uchida, M. Cassim, Y. Hayashida, M. Goto</i>	

Human Activity Recognition Supporting Context Appropriate Reminders for Elderly	264
<i>Venet Osmani, Daqing Zhang, Sasitharan Balasubramaniam</i>	
A Modular Clinical Decision Support System Clinical Prototype Extensible into Multiple Clinical Settings	268
<i>Fran Wu, Mitch Williams, Peter Kazanzides, Ken Brady, Jim Fackler</i>	
User-centered Activity Management System for Elderly People Empowering Older People with Interactive Technologies	272
<i>Otjacques Benoit, Krier Marc, Feltz Fernand, Ferring Dieter, Hoffmann Martine</i>	
Enabling Pervasive Healthcare by Means of Event- Driven Service-Oriented Architectures The Case of Bed Management in Mid-Sized to Large-Sized Hospitals	276
<i>Rene Fitterer, Bart de Witte</i>	
Wearable Sensors for Pervasive Healthcare Management	280
<i>Daniel Olguin Olguin, Peter A. Gloor, Alex (Sandy) Pentland</i>	
Intelligent Electrode Design for Long-term ECG Monitoring at Home Prototype Design Using FPAA and FPGA	284
<i>Geng Yang, Jian Chen, Hannu Tenhunen, Li-Rong Zheng</i>	
A Secure Electronic Diary and Data Collection Tool	288
<i>Kenny Morrison, Ian W. Ricketts, Nigel B. Pitts, Martyn C. Jones, Frank M. Sullivan, Derek W. Johnston</i>	
Perform: a System for the Monitoring and Management of Persons with Chronic Motor Neurodegenerative Disorders. a Study on Parkinson’s Disease and Amyotrophic Lateral Sclerosis	292
<i>Dina Baga, Dimitrios I. Fotiadis, Spiros Konitsiotis, Metin Akay</i>	
Prototyping of a Remote Monitoring System for a medical Personal Area Network using Python	297
<i>M. J. Moron, J. R. Luque, A. Gomez-Jaime, E. Casilari, A. Diaz-Estrella</i>	
A Wearable Inductor Channel Design for Blood Pressure Monitoring System in Daily Life	302
<i>Seulki Lee, Jerald Yoo, Hoi-Jun Yoo</i>	
Managing First Response Medical Aids With An Altruistic Web Application	306
<i>Stefano Ferretti, Silvia Mirri, Marco Rocchetti, Claudio Sermenghi, Vito Conforti</i>	
Web Services to Improve Interoperability of Home Healthcare Devices	310
<i>Guido Moritz, Elmar Zeeb, Frank Golatowski, Dirk Timmermann, Regina Stoll</i>	
Problems: Reflecting on a Technology Probe Into Peer Involvement in Cardiac Rehabilitation	314
<i>Julie Maitland, Matthew Chalmers</i>	
Server-assisted Context-Dependent Pervasive Wellness Monitoring	318
<i>Archan Misra, Ben Falchuk, Shoshana Loeb</i>	
A Pervasive Solution for Risk Awareness in the Context of Fall Prevention	322
<i>Nicholas Caporusso, Irene Lasorsa, Oliviero Rinaldi, Leonardo la Pietra</i>	
A Theoretic Algorithm for Fall and Motionless Detection	330
<i>Shumei Zhang, Paul McCullagh, Chris Nugent, Huiru Zheng</i>	
Parkinson’s Disease Patients’ Perspective on Context Aware Wearable Technology for Auditive Assistance	336
<i>Marc Bachlin, Meir Plotnik, Daniel Roggen, Noit Inbar, Nir Giladi, Jeffrey Hausdorff, Gerhard Troster</i>	
Location Based Semantic Annotation for Ward Analysis	344
<i>Mark J. Weal, Danius T. Michaelides, Kevin R. Page, David C. De Roure, Mary Gobbi, Eloise Monger, Fernando Martinez</i>	
Semantic Coordination of Ambient Intelligent Medical Devices – A Case Study	352
<i>Safdar Ali, Stephan Kiefer</i>	
A Model Driven Ontology-based Architecture for Supporting the Quality of Services in Pervasive Telemedicine Applications	358
<i>Ebrahim Nageba, Jocelyne Fayn, Paul Rubel</i>	
Privacy Enforcement for Distributed Healthcare Queries	366
<i>Michael Siegenthaler, Ken Birman</i>	
Privacy-aware Access to Patient-controlled Personal Health Records in Emergency Situations	372
<i>Nurul Huda, Shigeki Yamada, Noboru Sonehara</i>	
Secure Healthcare Information Exchange for Local Domains	378
<i>Guy C. Hembroff, Sead Muftic</i>	
Secure Sensor Data Transmission over Wireless Cellular Networks	385
<i>George M. Stamatelos</i>	
Textile Sensors to Measure Sweat pH and Sweat-rate During Exercise	390
<i>Shirley Coyle, Deirdre Morris, King-Tong Lau, Nicola Taccini, Daniele Costanzo, Pietro Salvo, Fabio Di Francesco, Maria Giovanna Trivella, Jacque-Andre Porchet, Jean Luprano</i>	
Low Power Real-Time Seizure Detection for Ambulatory EEG	396
<i>Kunjan Patel, Chern-Pin Chua, Stephen Faul, C. J. Bleakley</i>	

A Fitting Method for Headphones to Compensate Individual Hearing Impairments	403
<i>Hannah Baumgartner, Arne Schulz, Andreas Hein, Inga Holube, Tobias Herzke</i>	
Informing the Design of an Automated Wayfinding System for Individuals with Cognitive Impairments	411
<i>Alan L. Liu, Harlan Hile, Gaetano Borriello, Henry Kautz, Pat A. Brown, Mark Harniss, Kurt Johnson</i>	
Context-aware Multi-lead ECG Compression Based on Standard Image Codecs	419
<i>Maria G. Martini, Alessandro Polpetta, Paolo Banelli</i>	
The Smart Condo: Visualizing Independent Living Environments in a Virtual World	426
<i>Nicholas M. Boers, David Chodos, Jianzhao Huang, Pawel Gburzynski, Ioanis Nikolaidis, Eleni Stroulia</i>	
A Context Aware Wireless Body Area Network (BAN)	434
<i>Tony O'Donovan, John O'Donoghue, Cormac Sreenan, David Sammon, Philip O'Reilly, Kieran A. O'Connor</i>	
Characterization and Modeling of Dynamic On-body Propagation	442
<i>Bin Zhen, Minseok Kim, Jun-ichi Takada, Ryuji Kohno</i>	
Vesta: A Secure and Autonomic System for Pervasive Healthcare	448
<i>Yanmin Zhu, Morris Sloman, Emil Lupu, Sye Loong Keoh</i>	
Mobile Support for Personalized Therapies OminSCOPE: Richer Artefacts and Data Collection	456
<i>Marco de Sa, Luis Carrico</i>	
Pervasive Pain Monitoring System User Experiences and Adoption Requirements in the Hospital and Home Environments	464
<i>Ismo Alakarppa, Jukka Riekkii, Rauni Koukkula</i>	
P4Well Concept to Empower Self-Management of Psychophysiological Wellbeing and Load Recovery	472
<i>Antti P. Happonen, Elina Mattila, Marja-Liisa Kinnunen, Veikko Ikonen, Tero Myllymaki</i>	
Author Index	