2011 5th International Conference on Pervasive Computing Technologies for Healthcare

(PervasiveHealth 2011)

Dublin, Ireland
23-26 May 2011

IEEE Catalog Number: CFP1124C-PRT
ISBN: 978-1-61284-767-2

Contents

Preface xii

Conference Organization xiv

PH2011 Conference

A Framework for Overcoming Challenges in Designing Persuasive Monitoring and Feedback Systems for Mental Illness 1
Gabriela Marcu, Jakob Bardram, Silvia Gabrielli

A measurement device for motion analysis of patients with Parkinson's disease using sensor based smart clothes 9
Khalil Niazmand, Karin Tonn, Anastasios Kalaras, Tim C. Lueth, Kai Boetzel, Jan-Hinnerk Mehrkens, S. Kammermeier

A new device for motion-aware ambulatory blood pressure measurement 17
Lorenzo D'Angelo, Martin Lohmann, Tim Lueth

A Personalized Exercise Trainer for Elderly 24
Daniel Steffen, Gabriele Bleser, Markus Weber, Didier Stricker, Laetitia Fradet, Frederic Marin

A Toolkit to Explore Lived Experience of Motivation: When Words are Not Enough 32
Lesley Axelrod, Geraldine Fitzpatrick, Madeline Balaam, Sue Mawson, Jane Burridge, Ian Ricketts, Penny Probert Smith, Tom Rodden

Accelerometer Based Real-Time Activity Analysis on a Microcontroller 40
Axel Czabke, Sebastian Marsch, Tim Lueth

An approach to structuring reasoning for interpretation of sensor data in home-based health and well-being monitoring applications 47
Herman ter Horst, Alexander Sinitsyn

aTUG: Fully-automated Timed Up and Go Assessment Using Ambient Sensor Technologies 55
Thomas Frenken, Björn Vester, Melina Brell, Andreas Hein

Cautious, but Optimistic: An Ethnographic Study on Location and Content of Primary Care Providers using Electronic Medical Records 63
Christopher Schaefbauer, Katie Siek

Evaluation of an Inexpensive Depth Camera for Passive In-Home Fall Risk Assessment 71
Erik Stone, Marjorie Skubic

Eye tracking and pupil size variation as response to affective stimuli: a preliminary study 78
Antonio Lanata, Antonino Armato, Gaetano Valenza, Enzo Pasquale Scilingo

HEARME: a touch-to-speech UI for medicine identification 85
Marja Harjumaa, Minna Isomursu, Salla Muuraiskangas, antti Konttila

Integrating Volunteered Geographic Information into Pervasive Health Computing Applications 93
Peter Mooney, Padraig Corcoran

Non-contact, non-obtrusive electrocardiography in clinical environements 101
Bhavin Chamadiya, Kunal Mankodiya, Manfred Wagner, Rayan Nasreddine, Ulrich Hofmann

Towards a Pervasive Kitchen Infrastructure for Measuring Cooking Competence 107
Juergen Wagner, Thomas Ploetz, Aart van Halteren, Paula Moynihan, Jettie Hoonhout, Cuong Pham, Dan Jackson, Cas Ladha, Karim Ladha, Patrick Olivier

PEAR: Power Efficiency through Activity Recognition (for ECG-based Sensing) 115
Feng-Tso Sun, Cynthia Kuo, Martin Griss

PERVASIVE NURSING AND DOCTORAL ASSISTANT - PINATA 123
Alexiei Dingli, Charlie Abela, Ilenia D'Ambrogio

PI: Perceiver and Interpreter of Smart Home Datasets 131
Juan Ye, Graeme Stevenson, Simon Dobson, Michael O'Grady, Gregory O'Hare

Power Efficient Networking Using a Novel Wake-up Radio 139
Stevan Marinkovic

Supporting Stakeholder Needs by Ceding Control: The Benefits of Listening to End-Users 144
David Kutzik, Anthony Glascock

Telemonitoring for Independently Living Elderly: Inventory of Needs & Requirements 152
Sander Bakkes, Richard Morsch, Ben Kröse

The Design of a Mobile Portion Size Estimation Interface for a Low Literacy Population 160
Beenish Chaudry, Kay Connelly, Katie Siek, Janet Welch

Towards a Generalized Regression Model for On-body Energy Prediction from Treadmill Walking 168
Harshvardhan Vathsangam, Adar Emken, Todd Schroeder, Donna Spruijt-Metz, Gaurav Sukhatme

Ubimedic2: An Agent-Based Approach in Territorial Emergency Management 176
Elton Domnori, Giacomo Cabri, Letizia Leonardi

PH2011 Doctoral Consortium

Feasibility Study on iPhone Accelerometer for Gait Detection 184
Herman Chan, Huiru Zheng, Haiying Wang, Rachel Gawley, Mingjing Yang, Roy Sterritt

Salutogenesis: A new paradigm for pervasive computing in healthcare environments? 188
Cathy Dalton, Kevin McCartney

Using ICT to overcome barriers to behaviour change and implement lifestyle interventions. 192
Amy Fielden

PH2011 Demonstrations

'My Sweat my Health': Real Time Sweat Analysis Using Wearable Micro-fluidic Devices 196
Vincenzo Fabio Curto, Nikolay Angelov, Shirley Coyle, Robert Byrne, Sarah Hughes, Niall Moyna, Dermot Diamond, Fernando Benito Lopez

A Smart Wireless Inertial Measurement Unit System 198
Mark Gaffney, Michael Walsh, Seán O'Connell, Binyu Wang, Brendan O'Flynn, Cian Ó Mathúna

Managing Territorial Emergencies with Ubimedic2 200
Elton Domnori, Giacomo Cabri, Letizia Leonardi

Mobile Application and Wearable Sensors for Use in Cognitive Behavioral Therapy for Drug Addiction and PTSD 202
Richard Fletcher, Sharon Tam, Olufemi Omojola, Richard Redemske, Szymon Fedor, Joseph Mugisha

The MONARCA Self-assessment System - Persuasive Personal Monitoring for Bipolar Patients 204
Mads Frost, Gabriela Marcu, Rene Hansen, Karoly Szaántó, Jakob Bardram

REFRESH: REcommendations and Feedback for Realising and Stabilising Health 206
Bernd Ludwig, Stefan Mandl, David Elsweiler, Stefanie Mika

The NOCTURNAL Ambient Assisted Living System 208
William Carswell, Juan Augusto, Maurice Mulvenna, Jonathan Wallace, Suzanne Martin, Paul McCullagh, Huiru Zheng, Haiying Wang, Kevin McSorley, Barbara Taylor, Paul Jeffers

PH2011 Posters

"What's your number?" A survey of how parents and teens cope with diabetes in the context of technology support 210
Tammy Toscos, Kay Connelly, Yvonne Rogers

A medical study on wireless inertial measurement technology as a tool for identifying patients at risk of death or imminent clinical deterioration 214
Michael Walsh, Mark Gaffney, John Barton, Brendan O'Flynn, Cian O'Mathuna, John Kellett, Anne Hickey

A novel approach for assessing gait using foot mounted accelerometers 218
Matt Patterson, Brian Caulfield

Automatic Fall Detection Based on Doppler Radar Motion Signature 222
Liu Liang, Mihail Popescu, Marjorie Skubic, Marilyn Rantz, Tarik Yardibi, Paul Cuddihy

Capturing patients' daily life experiences after Total Hip Replacement 226
J.C. Jimenez, Natalia Romero, David Keyson

Development of Portable Device for Monitoring the Lithium Level from Bipolar Disorder Patients 230
Jungho Kim, Dermot Diamond, King Tong Lau

Increased Data Quality in Home Blood Pressure Monitoring through Context Awareness 234
Stefan Wagner, Thomas Toftegaard, Olav Bertelsen

Integration of textile-based sensors and Shimmer for breathing rate and volume measurement 238
Carlos Rovira-Borràs, Shirley Coyle, Dermot Diamont, Florin Stroiescu, Kieran Daly, Brian Corcoran

Location of an Inhabitant for Domotic Assistance Through Fusion of Audio and Non-Visual Data 242
Pedro Chahuara, François Portet, Michel Vacher

Toward Conducting Motivational Interviewing with an On-Demand Clinician Avatar for Tailored Health Behavior Change Interventions 246
Christine Lisetti, Ugan Yasavur, Ubbo Visser, Naphtali Rishe

Motivate: towards Context-Aware Recommendation Mobile System for Healthy Living 250
Yuzhong Lin, Joran Jessurun, Bauke de Vries, Harry Timmermans

Requirements Gathering for the Delivery of Healthcare Data in Aware Homes 254
Julie Doyle, Brian O'Mullane, Ann O'Hanlon, Benjamin Knapp

Smartphone-Based Applications for Investigating Falls and Mobility 258
Carlo Tacconi, Sabato Mellone, Lorenzo Chiari

Social Interaction around Diet Applications: An Initial Study 262
Feng Gao, mc schraefel

Acoustical Method for Objective Food Intake Monitoring Using a Wearable Sensor System 266
Sebastian Päßler, Wolf-Joachim Fischer

WS1: DIILT 2011

Development of a Telemedical Platform: Challenges, Requirements, and Solutions 270
Rajib Ghosh, Heiko Schellhorn

End-of-Life and Living Technologies, The role of Telemedicine in palliative care of children and young people 274
Sharon Levy, Gaye Steele

Engaging with End-Users of Independent Living Technology in Scotland... The Experience of The Blackwood Foundation 278
Matt-Mouley Bouamrane, David Jarrold

Ontology Driven Cardiovascular Decision Support System 283
kamran farooq, Amir Hussain, Stephen Leslie, Chris Eckl, Warner Slack

Smart Home Technology and Special Needs: Reporting UK activity and Sharing Implemention Experiences from Scotland 287
jeremy linskell

Toward Dynamic Service Provisioning in the Homecare Domain 292
Alireza Zarghami, Mohammad Zarifi Eslami, Brahmananda Sapkota, Marten Van Sinderen

Understanding the Implementation & Integration of Remote & Tele-Health Services ... an Overview of Normalization Process Theory 300
Matt-Mouley Bouamrane, Janice Osbourne, Frances Mair

WS2:Mindcare 2011

Correlation Between Self-Reported Mood States and Objectively Measured Social Interactions at Work: A Pilot Study 308
Alban Maxhuni, Aleksandar Matic, Venet Osmani, Oscar Mayora

From self-monitoring to self-understanding: Going beyond physiological sensing for supporting wellbeing 312
Dana Pavel, Vic Callaghan, Anind Dey

Potential Role of Wearable, Ambulatory and Home Monitoring Systems for Patients with Neurodegenerative Diseases and Their Caregivers 316
Paolo Meriggi, Paolo Castiglioni, Francesco Rizzo, Valerio Gower, Renzo Andrich, Marco Rabuffetti, Maurizio Ferrarin, Marco Di Rienzo

The combined use of Brain Computer Interface and Eye-Tracking technology for cognitive assessment in Amyotrophic Lateral Sclerosis 320
Pietro Cipresso, Paolo Meriggi, Laura Carelli, Federica Solca, Daniela Meazzi, Barbara Poletti, Dorothée Lulé, Albert Ludolph, Giuseppe Riva, Vincenzo Silani

User-centered Depression Prevention: An EEG approach to pervasive healthcare 325
Hong Peng, Bin Hu, Quanying Liu, Qunxi Dong, Qinglin Zhao, Philip Moore

WS3:PervaSense 2011

Comparison of Nearest Neighbour and Neural Network Based Classifications of Patient's Activity 331
Matti Pouke, Risto Honkanen

Designing a Telecare Product for the Elderly 336
Obinna Onyimadu, Fraser Harding, Jim Briggs

Introducing a low-cost Ambient Monitoring System for Activity Recognition 340
Sebastian Chiriac, Gabi Stummer, Bruno Rosales Saurer, Christophe Kunze

Requirements for a Behaviour Pattern Based Assistant for Early Detection and Management of Neurodegenerative Diseases 346
Andreas Hochgatterer, Lukas Roedl, Alberto Martinez, Igone Etxeberria, Erkuden Aldaz, Bernhard Wöckl, Jürgen Bund

Fall Detection With Distributed Floor-Mounted Accelerometers 354
Franz Werner, Josef Diermaier, Paul Panek, Sebastian Schmid

WS4:CoSN-PH 2011

Activity Detection Using Frequency Analysis and Off-the-shelf Devices 362
Sebastian Bersch, Christian Chislett, Djamel Azzi, Rinat Khusainov, Jim Briggs

Cognitive Sensor Networks: Towards Self-Adapting Ambient Intelligence for Pervasive Healthcare 366
Matthias Baumgarten, Maurice Mulvenna

Continuous Functional Activity Monitoring Based on Wearable Tri-axial Accelerometer and Gyroscope 370
Yuting Zhang, Inbal Sapir, Stacey Markovic, Robert Wagenaar, Thomas Little

WS5:EFHR 2011

A changing stroke rehabilitation environment: Implications for upper limb 374

interventions
Lucy Jones, Frederike van Wijck, Madeleine Grealy, Philip Rowe

A Need for Meaningful Visual Feedback of Lower Extremity Function After Stroke 379
Heather Thikey, Frederike van Wijck, Madeleine Grealy, Philip Rowe

Delivering Group-Based Services to the Home via the Internet: Maximising Clinical and Social Benefits 384
Andrea Taylor, David Godden, Angus Aitken, Judith Colligan, Richard Wilson

Design Considerations in Therapeutic Exergaming 389
Julie Doyle, Daniel Kelly, Brian Caulfield

Enhancing dialogues between rehabilitation patients and therapists using visualisation software 394
David Loudon, Alastair Macdonald

Improving independence in the community for stroke survivors 399
Bruce Carse, Roy Bowers, Barry Meadows, Philip Rowe

Investigating the feasibility of a wireless motion capture system to aid in the rehabilitation of total knee replacement patients 404
Mobolaji Ayoade, Lee Morton, Lynne Baillie

Rehabilitative TeleHealthCare for post-Stroke Outcome Assessment 408
Gabriela Postolache, Claudia Maia Moura, Pedro Silva Girão, Octavian Postolache

Designing Enjoyable Multimodal Activities to Reduce Falls Risk in the Community 414
Stephen Uzor, Lynne Baillie, Dawn Skelton

WS6:Orange Alerts AAL 2011

Ambient Assessment of Daily Activity and Gait Velocity 418
Lorcan Walsh, Barry Greene, Adrian Burns, Cliodhna Ní Scanaill

An approach for detecting deviations in daily routine for long-term behavior analysis 426
Denis Elbert, Holger Storf, Michael Eisenbarth, Özgür Ünalan, Mario Schmitt

Assisted Living Services for Reminding and Prompting Activities of Daily Living: A Preliminary Case Study 434
Xin Hong, Chris Nugent, Steven Devlin, Maurice Mulvenna, J. Wallace, Suzanne Martin

Interpreting Presence Sensor Data and Looking for Similarities Between Homes Using Cluster Analysis 438
John Loane, Brian O'Mullane, Brennon Bortz, Ben Knapp

Orange Alerts: Lessons from an Outdoor Case Study 446
jie wan, Michael O'Grady, Caroline Byrne, Gregory O'Hare

Prospect of Smart Home-Based Detection of Subclinical Depressive Disorders 452
Enrique Leon, Manu Montejo, Iñigo Dorronsoro

WS7:ATTACH 2011

A Platform for Self-Management Supported by Assistive, Rehabilitation and 458

Telecare Technologies
Richard Davies, Leo Galway, Chris Nugent, Colin Jamison, Rachel Gawley, Paul McCullagh, Huiru Zhang, Norman Black

A Subjective Evaluation of Multimodal Notifications 461
David Warnock

An Improved EEG De-noising Approach in Electroencephalogram (EEG) for Home Care 469
Hong Peng, Bin Hu, Yanbing Qi, Qinglin Zhao, Martyn Ratcliffe

Delivering care at home through a smarter environment 475
Chris Nugent

End-User Perception Towards Pervasive Cardiac Healthcare Services: Benefits, Acceptance, Adoption, Risks, Security, Privacy and Trust. 478
Anandhi Dhukaram, Chris Baber, Lamia Elloumi, Bert-Jan van Beijnum, Paolo De Stefanis

Programming Home Care 485
Claire Maternaghan, Kenneth Turner

Purposeful Social Media as Support Platform 492
Chris Norval, John Arnott, Nick Hine, Vicki Hanson

Reminders that Make Sense: Designing Multimodal Notifications for the Home 495
Marilyn McGee-Lennon, Stephen Brewster

Telecare Service Challenge: Conflict Detection 502
Evan Magill, Jesse Blum

Wearable Rehab Technology for Automatic Measurement of Patients with Arthritis 508
James Connolly, Joan Condell, Kevin Curran, Philip Gardiner

WS8:PCPDC 2011

A sleep pattern analysis and visualization system to support people with early dementia 510
Hoda Nikamalfard, Huiru Zheng, Haiying Wang, Paul Jeffer, Maurice Mulvenna, Paul McCullagh

Monitoring of Cognitive Functioning by Measuring Reaction Times with Wearable Devices 514
Burcu Cinaz, Bert Arnrich, Gerhard Tröster

Prompting people with dementia to carry out tasks: What works and why? 518
Hazel Boyd, Nina Evans, Bruce Carey-Smith, Roger Orpwood

SenseCam intervention based on Cognitive Stimulation Therapy framework for Early-Stage Dementia. 522
Paulina Piasek, Kate Irving, Alan Smeaton

Supporting Reflection and Creative Thinking by Carers of Older People with Dementia 526
Kristine Karlsen, Konstantinos Zachos, Neil Maiden, Sara Jones, Ian Turner, Malcolm Rose, Kevin Pudney

WS9:UbiTher 2011

Mixed reality serious games for post-stroke rehabilitation 530
Ines Di Loreto, Abdelkader Gouaich, Nadia Hocine

On the Importance of Locations in Therapeutic Serious Games - Review on current health games and how they make use of the urban landscape 538
Martin Knöll, Magnus Moar

Exergames For Elderly. Social exergames to persuade seniors to increase physical activity. 546
ellen brox, Luis Fernandez-Luque, Gunn Evertsen, Juan González-Hernández

WS10:U-CDPHA 2011

Optimizing Long-Term Treatment of Rheumatoid Arthritis with Systematic Documentation 550
Klaus Simonic, Andreas Holzinger, Marcus Bloice, Josef Hermann

Situated Crowdsourcing: a Pragmatic Approach to Encouraging Participation in Healthcare Design 555
Paul Marshall, Rebecca Cain, Sarah Payne

Towards Ontology Co-creation in Institutionalized Care Settings 559
Lizzy Bleumers, An Jacobs, Nicky Sulmon, Mathijs Verstraete, Mieke Van Gils, Femke Ongenae , Ann Ackaert, Saar De Zutter

Data Recording in Primary Care Field Studies: Patient Records Enhancement Project 563
Lesley Axelrod, Geraldine Fitzpatrick, Flis Henwood, Jackie Cassell, Helen Smith, Amanda Nicholson, Greta Rait, Greta Rait

Care to share? Social innovation through low-budget, high impact welfare technologies 568
Mark Asboe, Erik Grönvall, Henry Michael Lassen

Motivation in Lifestyle Changes -Using Mock-ups as a Tool for Exploring the Design Space 572
Christine Jürgensen

People and a virtual doctor's visit: learning about multiple acceptance aspects of a telemedical scenario 577
Martina Ziefle, Sarah Mennicken, Oliver Sack

Perceived Usefulness of Assistive Technologies and Electronic Services for Ambient Assisted Living 585
Martina Ziefle Ziefle, Carsten Röcker, Andreas Holzinger

Perception of Privacy and Security for Acceptance of E-health Technologies Exploratory analysis for diverse user groups 593
Wiktoria Wilkowska, Martina Ziefle

Smart Clothing. Perceived Benefits vs. Perceived Fears 601
Anne Kathrin Schaar, Martina Ziefle

Technology Inspired Design for Pervasive Healthcare 609
Janet van der Linden, Yvonne Rogers, Criss Taylor, Mat Dalgleish

Users' Preferences for Telemedical Consultations. Comparing users' attitude towards different media in technology-mediated doctor-patient-communication 614
Shirley Beul, Martina Ziefle, Eva-Maria Jakobs