The 2nd ACM International Conference on PErvasive Technologies Related to Assistive Environments
PETRA 2009

Conference Program
(posted May 29, 2009)

June 10-13, 2009
Corfu, Greece

Organized by

The University of Texas at Arlington, Arlington, Texas, USA

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The National Science Foundation (NSF), CISE-Human Centered Computing, USA
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Dear Colleague,

You are cordially invited to join the PETRA 2009 Conference, the 2nd ACM International Conference on PErvasive Technologies Related to Assistive Environments, June 10-12, 2009, in Corfu, Greece.

Conference Theme
The PETRA Conference brings together different types of technology to address an important social and healthcare issue: as the world's population ages, there is growing interest in solutions for the in- home care of the elderly as well as for the care of people with Alzheimer's, Parkinson's and other disabilities or traumas. PETRA (which means "stone" in Greek) reflects the needs of the domestic environment, or "Oikos" as it was known in ancient Greece, but from a technological perspective. People's living environments are particularly important in an increasingly crowded and complex world where the need for inclusiveness and connectivity with the rest of the world is key. PETRA addresses the fact that, as people grow older, they will increasingly rely on technology to be able to stay in their homes.

The conference attracted paper submissions from 15 countries, which underwent a thorough reviewing process; 32 of these were accepted as full papers and 14 as short papers. The Petra Technical Program includes also the 6 following workshops with additional 35 papers.

PETRA WORKSHOPS
W1 **ABRA** - Affect and Behaviour Related Assistance in Support for the Elderly
W2 **AHETA** - Assistive Healthcare & Educational Technologies for special tArget groups
W3 **RAALS** - Robotics and Automation in Assistive Living Systems
W4 **MEAAE** - Multimedia Event Analysis for Assistive Environments
W5 **NANOHEALTH** - Nanoengineering and Nanomputing Applications for Pervasive Health Environments of the Future
W6 **PSPAE** - Privacy and Security in Pervasive e-Health and Assistive Environments

Conference and workshop papers will appear in the PETRA Conference proceedings published by ACM. Poster papers will appear in a special section of the CD proceedings.

		Room 1	Room 2
DAY ONE – JUNE 10	09:15-09:50	**Conference Opening** **Filia Makedon, University of Texas at Arlington (Conference Chair)** **Ilias Maglogiannis, University of Central Greece (Program Committee CoChair), Heng Huang, University of Texas at Arlington (Program Committee Co-Chair)** **Rector, Ionian University, Welcome to Greece and Corfu Island**	
	09:50-10:50	_**Session A:**_ _Plenary_ _**Session chair: Filia Makedon**_ _**A1 - Keynote Lecture**_ : **Dust to Doctors: Wireless Sensor Networks for Medical Care,** _John A. Stankovic University of Virginia, USA_	
	10:50-11:10	**Coffee Break**	
	11:10-12:50	_**Session B:** Tools, Infrastructures, Architectures and Techniques for Deploying Pervasive Applications in Assistive Environments I._ _**Session Chair: Dimitris Vergados**_ **B1 Realistic and Robust Head-Eye Coordination of Conversational Robotic Actors in Human Tracking Applications** Jartuwat Rajruangrabin, Dan Popa **B2 An Efficient K-anonymous Localization Technique for Assistive Environments** Francesco Buccafurri, Gianluca Lax **B3 Assistive Music Browsing Using Self-Organizing Maps** George Tzanetakis, Manj Benning, Darren Minifie , Steven Ness **B4 SAL: A Simulation and Analysis Tool for Assistive Living Applications** Alan Bowling, Zhengyi Le, Fillia Makedon **B5 STFL: A SpatioTemporal Filtering Language with Applications in Assisted Living** Athanasios Bamis, Andreas Savvides	_**Session C:** Context Awareness, Reasoning and Machine Learning for Assistive Environments. **Session Chair: Dimitris Kosmopoulos**_ **C1 A Context Reasoning Using Sensor Data Fusion Method Based on DSm Theory in Home-based Care** Hyun Lee, Jae sung Choi, Ramez Elmasri **C2 Decision Making in Assistive Environments Using Multimodal Observations** Yong Lin, Eric Becker, Kyungseo Park , Zhengyi Le, Fillia Makedon **C3 Human Behavioral Detection and Data Cleaning in Assisted Living Environments using Wireless Sensor Networks** Kyungseo Park, Eric Becker, Jyothikeshavan Vinjumur, Zhengyi Le, Fillia Makedon **C4 Providing QoS in Ontology Centered Context Aware Pervasive Systems** Roman Arora, Vangelis Metsis, Rong Zhang, Fillia Makedon **C5 ODM-based Architecture for The Development of Mobile Context-aware Applications:** Samyr Vale
	12:50-14:10	**Lunch Break**	
	14:10-15:50	_**Session D:** Tools, Infrastructures, Architectures and Techniques for Deploying Pervasive Applications in Assistive Environments II_ _**Session Chair: Angelos Rouskas**_ **D1 Towards An Intelligent and Supportive Environment for People with Physical or Cognitive Restrictions** Julio Abascal, Borja Bonail, Alvaro Marco, Roberto Casas, José luis Sevillano **D2 Human-Robot Team Dynamic Performance in Assisted Living Environments** Alan Bowling, Eric Olson **D3 Constructing The Medical Thesaurus As Tool for Indexing** Yousef Abuzir **D4 Dynamic Service Composition in Ubiquitous Environment** Yun-young Hwang, Kyu-chul Lee **D5 UbiSmartWheel – A Ubiquitous System with Unobtrusive Services Embedded on A Wheelchair** Octavian Postolache, Rui Madeira, Nuno Correia, Pedro Girão	_**Workshop W1:** Affect and Behaviour Related Assistance in Support for the Elderly I_ _**Session Chairs: Christian Peter, Kostas Karpouzis, Gerald Bieber**_ **W1.1 'Senior Moments': Loss and Context** Stefan p. Carmien, Randal a. Koene, Francesca i. Cavallaro **W1.2 Activity Monitoring by Fusion of Optical and Mechanical Tracking Technologies for User Behavior Analysis** Gerald Bieber, Andre Hoffmeyer, Enrico Gutzeit, Christian Peter, Bodo Urban **W1.3 Ageing in a Networked Society – Social Inclusion and Mental Stimulation** John Waterworth, Soledad Ballesteros, Christian Peter, Gerald Bieber, Andreas Kreiner **W1.4 Ambient Kitchen: Designing Situated Services Using a High Fidelity Prototyping Environment** Patrick Olivier, Andrew Monk, Guangyou Xu, Jesse Hoey **W1.5 Design and Prototype of A Device to Engage Cognitively Disabled Older Adults in Visual Artwork** Scott Blunsden, Brandi Richards, Dan Jackson, Tom Bartindale, Jesse Hoey

15:50-16:10	**Coffee Break**
16:10-17:50	_Session E: Signal and Image Processing for Ambient Intelligence and Pervasive Computing_ _Session Chair: Margrit Betke_ **E1 Emergency Incidents Detection in Assisted Living Environments Utilizing Sound and Visual Perceptual Components** Charalampos Doukas, Ilias Maglogiannis, Aggelos Rouskas, Aristodimos Pneumatikakis **E2 Communicating through Gestures without Visual Feedback** Irene Sturm, Maria Schiewe, Wiebke Köhlmann, Helmut Jürgensen **E3 Towards Automated Large Vocabulary Gesture Search:** Alexandra Stefan, Haijing Wang, Vassilis Athitsos **E4 Event-based Experiments in An Assistive Environment Using Wireless Sensor Networks and Voice Recognition** Eric Becker, Zhengyi Le, Kyungseo Park, Yuong Lin, Fillia Makedon **E5 EOG Signal Processing and Analysis for Controlling Computer by Eye Movements** B. Estrany, P. Fuster, A. Garcia, Yuhua Luo	_Workshop W1: Affect and Behaviour Related Assistance in Support for the Elderly II_ _Session Chair: Kostas Karpouzis_ **W1.6 SmartDrawer: RFID-Based Smart Medicine Drawer for Assistive Environments** Eric Becker, Vangelis Metsis, Roman Arora, Jyothi Vinjumur, Yurong Xu **W1.7 Using The Human Body Field as A Medium for Natural Interaction** Andreas Braun, Pascal Hamisu
21:00	**Cocktail Welcome Reception**

	Room 1	Room 2
09:30-10:50	**_Session G: Plenary_** **_Session Chair: Ilias Maglogiannis University of Central Greece_** **_Invited Lectures_** **G1 - Managing Context Evolution in Pervasive Environments,** _Peter Scheuermann Northwestern University, USA_ **G2 - Camera-based Interfaces for People with Severe Motion Impairments,** _Dr. Margrit Betke Computer Science Department, Boston University USA_	
10:50-11:10	**Coffee Break**	
11:10-12:30	**_Session H: Wearable, Ambient and Home Based Health and Wellness Measurement and Monitoring Technologies_** **_Session Chair: Christian Peter_** **H1 Identifying People in Camera Networks Using Wearable Accelerometers** Thiago Teixeira, Deokwoo Jung, Gershon Dublon, Andreas Savvides **H2 A Mobile Rehabilitation Application for The Remote Monitoring of Cardiac Patients after A Heart Attack or A Coronary Bypass Surgery** Valerie Gay, Peter Leijdekkers, Edward Barin **H3 Ubiquitous Wireless Infrastructure for Elderly Care** Muid Mufti, Dimitris Agouridis, Sami Uddin, Adeel Mukhtar **H4 The Application of A Physical Activity and Location Measurement System to Public Health Interventions to Promote Physical Activity** Gillian Maclellan, Lynne Baillie, Malcolm Granat	**_Session I: Homecare Systems_** **_Session Chair: Agis Iliades_** **I1 A Scheme for On-Site Service Provision in Pervasive Assistive Environments** Grammati Pantziou, Petros Belsis, Damianos Gavalas, Charalampos Konstantopoulos, Basilis Mamalis **I2 Zombee: A Home Automation Prototype for Retrofitted Environments** Dacian Tudor, Andrei Stancovici, Bogdan Popescu, Gernot Reisinger, Vladimir Cretu **I3 Assistive Technologies for Use in The Home to Prolong Independence** Kathryn Daniel, Carolyn Cason, Sherry Ferrell **I4 Experiencing NFC-based Touch for Home Healthcare** Rosa Iglesias, Jorge Parra, Cristina Cruces, Nuria Gomez de segura
12:30-13:50	**Lunch Break**	
13:50-14:50	**_G3 - Keynote Lecture_ - Analyzing Security in Pervasive Assistive Environments,** _Matt Bishop, University of California, Davis,USA_	
14:50-16:10	**_Workshop W2: Assistive Healthcare & Educational Technologies for Special Target groups I_** **_Session Chair: Panos Bamidis_** **W2.1 A Portable Medical Unit for Medical Imaging Tele-collaboration** Ilias Sachpazidis, George Kontaxakis, Luca Salvatore, Georgios Sakas **W2.2 A Wireless System for Monitoring of Children with Suspected Cardiac Arrhythmias** Efthyvoulos Kyriacou, Constantinos Pattichis, Jossif Antonis , Marios Pattichis, Loukas Paraskeva **W2.3 A Wireless Distributed Framework for Supporting Assistive Learning Environments** Christos Skourlas, Petros Belsis, Fotini Sarinopoulou, Anastasios Tsolakidis, Dimitris Vassis **W2.4 An Auditory Computer-based Training for Mild Cognitive Impairment and Mild Alzheimer's Disease - German Prototype of The Brain Fitness Program** Vera m. Leirer, Franka Glöckner, Thomas Elbert, Iris-tatjana Kolassa	**_Workshop W3: Robotics and Automation in Assistive Living Systems_** **_Session Chairs: Alan Bowling, Panayiotis Shiakoas, Manfred Huber_** **W3.1 An Intelligent Robotic Assistive Living System** Raymond Jarvis, Ray Jarvis, Om Gupta, Sutono Effendi, Zhi Li **W3.2 ASIBOT Assistive Tasks at Domestic Environment: Challenges and Approaches** Alberto Jardon huete, Juan carlos González víctores, Martin Stoelen, Santiago Martinez de la casa diaz, Carlos Balaguer **W3.3 Methodology for Robot Mapping and Navigation in Assisted Living Environments** Syed atif Mehdi, Christopher Armbrust, Jan Koch, Karsten Berns **W3.4 Wheelchair-based Open Robotic Platform and Its Performance Within the AmbienNet Project** Borja Bonail, Julio Abascal, Luis Gardeazabal

DAY TWO – JUNE 11

16:10-16:30	Coffee Break	
16:30-18:10	*Workshop W2: Assistive Healthcare & Educational Technologies for Special Target groups II* ***Session Chair: Eleni Kaldoudi*** **W2.5 Involvement of Elderly Citizens as Potential End Users of Assistive Technologies in The Living Lab Schwechat** Walter Hlauschek, Paul Panek, Wolfgang Zagler **W2.6 T-Seniority: An Online Service Platform to Assist Independent Living of Elderly Population** Vasiliki Moumtzi, Josefina Farinos, Christopher Wills **W2.7 The Interpetivism Approach in The Evaluation of Homecare Telematics Interventions** Eleni Kaldoudi, Antonia Chatzopoulou, Vassilis Vargemezis **W2.8 Using Affective Avatars and Rich Multimedia Content for Education of Children with Autism** Evdokimos Konstantinidis, Andrej Luneski, Maria Nikolaidou, Magda Hitoglou-Antoniadou, Panagiotis Bamidis **W2.9 Description and Future Trends of ICT Solutions Offered Towards Independent Living: The Case of LLM Project** Christos Frantzidis, Panagiotis Bamidis	*Workshop W4: Multimedia Event Analysis for Assistive Environments* ***Session Chairs: D. Kosmopoulos, A. Doulamis, N. Doulamis*** **W4.1 Hybrid Tracking Approach for Assistive Environments** Constantinos Lalos, Vasilios Anagnostopoulos, Kleopatra Konstanteli **W4.2 Learning to Recognise Behaviours of Persons with Dementia Using Multiple Cues in An HMM-based Approach** Christian Peters, Sven Wachsmuth, Jesse Hoey **W4.3 Towards Faster Activity Search Using Embedding-based Subsequence Matching** Panagiotis Papapetrou, Paul Doliotis, Vassilis Athitsos **W4.4 PEON: Privacy-Enhanced Opportunistic Networks with Applications in Assistive Environments** Matthew Wright, Zhengyi Le, Gauri Vakde
	Optional excursion to Kanoni and exploring the town of Corfu	

THIRD DAY: JUNE 12

	Room 1	Room 2
09:30-10:50	*Session J: Plenary* *Session Chair: Heng Huang University of Texas at Arlington* *Invited Lectures* **J1 - Events and Steams: How to Improve Assisted Living Environments through Automation,** *Sharma Chakravarthy University of Texas at Arlington USA* **J2 - Bio-Nano and BioMEMS: Novel Biochips for Genes and Proteins,** *Samir M. Iqbal University of Texas at Arlington USA*	
10:50-11:10	**Coffee Break**	
11:10-13:10	*Session K: Privacy, Security, Trust and Interoperability in Assistive Environment* *Session Chair: Lynne Baillie* **K1 A Mediation Framework for Achieving Interoperability in Pervasive Grid-Based Home Care Systems** Vassiliki Koufi, Flora Malamateniou, George Vassilacopoulos **K2 Privacy and Resource Protection in Personal Network Federations** Charalampos Patrikakis, Dimitrios Kyriazanos, Athanasios Voulodimos, Ioannis Nikolakopoulos **K3 Strong Mobile Device Protection from Loss and Capture** Zhengyi Le, Matt Bishop, Fillia Makedon **K4 A Preliminary Feedback for The WCAG 2.0 - WCAG 1.0 Vs WCAG 2.0 Evaluation Study** Maria Kapsi, Evangelos Vlachogiannis, Jenny Darzentas, Thomas Spyrou **K5 SketchML A Representation Language for Novel Sketch Recognition Approach** Danilo Avola, Andrea Del buono, Giorgio Gianforme, Stefano Paolozzi, Rui Wang **K6 Ubi-Designer: A Web-Based Toolkit for Configuring and Field-Testing UbiComp Prototypes** Martijn Vastenburg, Halldór Fjalldal, Charles Van der Mast	*Session L: Networking Technologies for Healthcare Information Storage, Transmission, Processing, and Feedback* *Session Chair: Sharma Chakravarthy* **L1 3DE: Selective Cluster Head Selection Scheme for Energy Efficiency in Wireless Sensor Networks** Jinsu Kim, Junghyun Lee, Keewook Rim **L2 Energy-Efficient Routing Protocols in Wireless Sensor Networks for Health Communication Systems** Nikolaos Pantazis, Stefanos Nikolidakis, Dimitrios Vergados **L3 Random Sampling Key Revocation Scheme for Distributed Sensor Networks** Helmut Jurgensen, Yuan Xue **L4 Automatic Sensor Placement in a 3D Volume** Eric Becker, Gutemberg Guerra-filho, Fillia Makedon **L5 A Technological Infrastructure Design for A Pediatric Oncology Network** Aniello Murano **L6 Semantic Pre-fetching and Caching Strategies for Location Dependent Data in Mobile Environments** Mary magdalene Jane F, Ilayaraja Natesan, Ashwin Raghav R, Nadarajan R, Maytham Safar
13:10-14:30	**Lunch Break**	
14:30-15:30	*J3 - Keynote Lecture* **Spatio-temporal human behavior analysis using simple sensors: Opportunities and Challenges,** *Andreas Savvides, Yale University,USA*	

DAY THREE – JUNE 12

		Session M: Usability and HCI issues, Multimodal Interfaces Session Chair: Peter Scheuermann **M1 Non-interrupting User Interfaces for Electronic Body-worn Swim Devices** Kilian Förster, Marc Bächlin, Gerhard Tröster **M2 A Multimodal Pervasive Framework for Ambient Assisted Living** Alessia D'andrea, Arianna D'ulizia, Fernando Ferri, Patrizia Grifoni **M3 Pervasive Computing and Disability: Designing for Independence** Pamela Briggs, Linda Little **M4 Towards A Social Fabric for Pervasive Assistive Environments** Clare Owens, David Millard, Andrew Stanford-clark **M5 More Than User-Friendly I/O Devices** Jan Smrz **M6 User-centered Sesign for Supporting The Self-management of Chronic Illnesses: An Interdisciplinary Approach** Torsi, Nasrin Nasr, Peter Wright, Sue Mawson	Workshop W5: Nanoengineering and Nanomputing Applications for Pervasive Health Environments of the Future Session Chairs: Agis Iliadis, Samir M. Iqbal **W5.1 Carbon Nanotube Coated High-Throughput Neurointerfaces in Assistive Environments** Mario Romero-Ortega, Ali Butt, Samir Iqbal **W5.2 Developing Quantum Nanocomputing for Pervasive Health Environments** Konstantinos Prousalis, Elisavet Konstantinou, Nikolaos Konofaos, Agis Iliadis **W5.3 Nanotechology for Biomedicine: Past, Present and Future** Robert Newcomb **W5.4 Rapid and Reliable Detection of Microbial Pathogens** Niranjan Malvadkar, Ping Kao, Hui Wang, Mary Pos
	15:30- 17:10		
	17:10- 18:30	**POSTERS AND DEMO SESSION (including coffee break)** *Session Chair: Euripidis Loukis*	**PETRA PHD FORUM (PPF) & NSF Doctoral Consortium Meeting**
	20:30	**GALA Conference Dinner (Bus will leave hotel at 20:30)**	

DAY FOUR – JUNE 13		**Room 1**
	9:15-10:35	***Workshop W6:*** *Privacy and Security in Pervasive e-Health and Assistive Environments I* **Session Chair: Grammati Pantziou** 　W6.1　**Development of AVoIP for Private Online Counseling in Assistive Environments** 　　　　Bikas Gurung, David Levine, Matthew Wright 　W6.2　**End to End Secure Communication in Ad-hoc Assistive Medical Environments Using Secure Paths** 　　　　Vassis Dimitris, Petros Belsis, Christos Skourlas, Stefanos Gritzalis 　W6.3　**Pervasive Healthcare: The Elderly Perspective** 　　　　Linda Little, Pam Briggs 　W6.4　**Security and Trust in Virtual Healthcare Communities** 　　　　Anargiros Chryssanthou, Iraklis Varlamis, Charikleia Latsiou
	10:35-10:50	**Coffee Break**
	10:50-11:50	***Workshop W6:*** *Privacy and Security in Pervasive e-Health and Assistive Environments II* **Session Chair: Petros Belsis** 　W6.5　**Privacy Aware Data Sharing: Balancing The Usability and Privacy of Datasets** 　　　　Bhume Bhumiratana, Matt Bishop 　W6.6　**Privacy Risks in Health Databases from Aggregate Disclosure** 　　　　Gautam Das, Nan Zhang 　W6.7　**Personalized Location Based Services with Respect to Privacy: A User Oriented Approach** 　　　　Charalampos Patrikakis, Athanasios Voulodimos, George Giannouli
	11:50-12:00	**Conference Closing**
		Optional excursions in Corfu or nearby islands

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