

The 8th ACM International Conference on PErvasive  
Technologies Related to Assistive Environments

# PETRA 2015

## Conference Program

July 1-3, 2015  
Corfu, Greece

### Organized by

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

### With sponsorship from:

***The National Science Foundation (NSF), USA***

***and the following:***

***College of Engineering, University of Texas at Arlington, USA***

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***University of Piraeus (Department of Digital Systems), GREECE***

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## Conference Proceedings

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**Digital Library Proceedings**



Dear Colleagues,

Welcome to the *8th ACM International Conference on Pervasive Technologies Related to Assistive Environments*, July 1-3 2015 in Corfu, Greece. We wish to acknowledge support from the National Science Foundation (NSF) that has awarded us a Doctoral Consortium grant to enable US-based graduate student authors to travel and present their results to the conference. Support was also provided by NSF's Computer Research Infrastructure (CRI) program in order to conduct a planning workshop on developing SMART-MOVE, a multimodal human activity recognition repository, that takes place on the third day of the conference. We also wish to acknowledge support by the Dean of the College of Engineering at the University of Texas Arlington (UTA) for travel grants offered to several UTA student authors.

The PETRA Conference brings together researchers from diverse disciplines who use pervasive computing technologies to improve the quality of life and enhance human performance. Results presented include not only basic research in computer vision, machine learning, data mining and big data, but also engineering applications and software solutions that improve, for example, vocational safety and productivity, physical or mental rehabilitation, better drug treatment, and other areas. The conference addresses the needs of both healthy individuals, as well as those with special needs, such as providing safe in-home care for the elderly, or for persons with Dementia, Alzheimer's, Parkinson's, chronic arthritis, or other conditions. PETRA also addresses the growing need of people living and working in an increasingly crowded and complex world who require inclusiveness and connectivity with the rest of the world. In summary, PETRA's novel computer-based methods and tools can help people build, stone by stone (PETRA means stone in Greek), new ways of life to survive in an increasingly challenging world. Best Paper Awards will be presented at the end of the conference for *Best Technical Paper*, *Best Paper for Novelty*, and *Best Student Paper*

## Invited Speakers



**Antonis Argyros** is a Professor of Computer Science at the Computer Science Department (CSD), University of Crete (UoC) and a researcher at the Institute of Computer Science (ICS), Foundation for Research and Technology-Hellas (FORTH) in Heraklion, Crete, Greece. He received his B.Sc. (1989) M.Sc. (1992) and Ph.D. (1996) degrees from CSD-UoC. He has been a postdoctoral fellow at the Computational Vision and Active Perception Laboratory (CVAP) at the Royal Institute of Technology (KTH), Stockholm, Sweden. Since 1999, as a member of the Computational Vision and Robotics Laboratory (CVRL) of ICS-FORTH, he has been involved in many RTD projects in computer vision, image analysis and robotics. His research interests fall in the areas of computer vision with emphasis on tracking, human gesture and posture recognition, 3D reconstruction and omnidirectional vision. He is also interested in applications of computer vision in the fields of robotics and smart environments. In these topics, he has published more than 120 papers in peer reviewed scientific journals, conferences and workshops. Antonis Argyros is an area editor for the Computer Vision and Image Understanding Journal (CVIU) and a member of the Editorial Board of the IET Image Processing Journal. He has served as one of the General Chairs of the 11th European Conference in Computer Vision (ECCV'2010) as well as in the organizing and program committees of several vision, graphics and robotics conferences and workshops. He is also a faculty member of the Brain and Mind interdisciplinary graduate program and a member of the Strategy Task Group of the European Consortium for Informatics and Mathematics (ERCIM).



**Vassilis Athitsos** is Associate Professor in the Department of Computer Science and Engineering (CSE) at the University of Texas at Arlington (UTA), Texas. He received the BS degree in mathematics from the University of Chicago in 1995, the MS degree in computer science from the University of Chicago in 1997, and the Ph.D. degree in computer science from Boston University in 2006. In 2005-2006 he worked as a researcher at Siemens Corporate Research, developing methods for database-guided medical image analysis. In 2006-2007 he was a postdoctoral research associate at the Computer Science department at Boston University. Since August 2007 he is a faculty member at UTA. His research interests include computer vision, machine learning, and data mining. His recent work has focused on gesture and sign language recognition, detection and tracking of humans using computer vision, efficient similarity-based retrieval in multimedia databases, and shape modeling and detection. His research has been supported by the National Science Foundation, including an NSF CAREER award.



**Elisabeth André** is a Full Professor of Computer Science at Augsburg University in Germany, and Chair of the Research Unit Human-Centered Multimedia. She received her Diploma and Doctoral Degrees in Computer Science from Saarland University. Elisabeth André has a long track record in multimodal human-machine interaction, embodied conversational agents, affective computing and social signal processing. She is on the editorial board of various renowned international journals, such as IEEE Transactions on Affective Computing (TAC), Journal of Autonomous Agents and Multi-Agent Systems (JAAMAS), ACM Transactions on Intelligent Interactive Systems (TIIS) and AI Communications. In 2007, Elisabeth André was nominated Fellow of the Alcatel-Lucent Foundation for Communications Research. In 2010, she was elected a member of the prestigious German Academy of Sciences Leopoldina, the Academy of Europe and AcademiaNet. She is an ECCAI Fellow (European Coordinating Committee for Artificial Intelligence).

FIRST DAY: July 1

	Room 1	Room 2
09:00-09:40	<b>Conference Opening</b> <b>Fillia Makedon, Conference Chair, University of Texas Arlington</b> <b>Ilias Maglogiannis, University of Piraeus, Department of Digital Systems, Greece (Program Committee Co-Chair)</b>	
09:40-10:40	<b>Session A. <u>Invited Lecture</u>: Antonis Argyros, “Visual Perception of Human Motion and Human-Object Interaction”</b> <b><u>Session Chair</u>: Fillia Makedon</b>	
10:40-11:00	<b>Coffee Break (20min)</b>	
11:00-13:00	<b>Session B: Usability and HCI issues</b> <b><u>Session Chair</u>: Jaakko Hollmen</b>  <b>B1 - Comparing Projected In-Situ Feedback at the Manual Assembly Workplace with Impaired Workers.</b> Markus Funk, Andreas Baechler, Liane Baechler, Oliver Korn, Christoph Krieger, Thomas Heidenreich, Albrecht Schmidt  <b>B2 - SmartTactMaps: A Smartphone-Based Approach to Support Blind Persons in Exploring Tactile Maps.</b> Timo Götzelmann, Klaus Winkler  <b>B3 - Pot Hunter: A Virtual Reality Game for Analyzing Range of Motion.</b> Shawn N. Gieser, Peter Sassaman, Eric Becker, Fillia Makedon  <b>B4 - About the Development of an Interactive Assistance System for Impaired Employees in Manual Order Picking.</b> Andreas Bächler, Peter Kurtz, Thomas Hörz, Georg Krüll, Liane Bächler, Sven Autenrieth  <b>B5 - Accessible Games for Blind Children, Empowered by Binaural Sound.</b> Konstantinos Drossos, Nikolaos Zormpas, George Giannakopoulos, Andreas Floros  <b>B6 - Design Approaches for the Gamification of Production Environments. A Study Focusing on Acceptance.</b> Oliver Korn, Markus Funk, Albrecht Schmidt	<b>Session C: Pervasive Systems for the Aged &amp; Smart Health Devices</b> <b><u>Session Chair</u>: Maureen Simmonds</b>  <b>C1 - Test Battery for Assessment of Cognitive Function in Older Employees: Performance, Brain Processes, and Cardiovascular “costs”.</b> Sergei Schapkin, Xenija Weissbecker-Klaus  <b>C2 - Maintaining Good Relationships in Clinical Setting: the Bonus DOMUS Project.</b> Kevin Bouchard, Sylvain Giroux, Robert Radziszewski, Mathieu Gagnon, Quentin Szymanski, Stéphanie Pinard, Mélanie Levasseur, Nathalie Bier  <b>C3 - Automatic Speed Control for SmartWalker.</b> Jiwon Shin, Ivo Steinmann, Bertrand Meyer  <b>C4 - A Survey on an Ingestible Sensor for Evaluating Medication Adherence in Elderly People.</b> Ioannis Kalpouzoz, Kostas Giokas, Dimitris Koutsouris  <b>C5 – Augmenting Everyday Artefacts to Support Social Interaction Among Senior Peers.</b> Elena Nazzi, Tomas Sokoler  <b>C6 - Cooking Risk Analysis to Enhance Safety of Elderly People in Smart Kitchen.</b> Rami Yared, Bessam Abdulrazak, Thomas Tessier, Philippe Mabillean
13:00-14:00	<b>Lunch Break (1 hour)</b>	

FIRST DAY: July 1

	Room 1	Room 2
14:00-16:00	<p><b>Session D. Robotic Devices and Multimodal Interfaces</b> <b>Session Chair:</b> <i>Taskin Padir</i></p> <p><b>D1 - An Interactive Framework for Learning User-Object Associations Through Human-Robot Interaction.</b> Michalis Papakostas, Konstantinos Tsiakas, Natalie Parde, Fillia Makedon, Vangelis Karkaletsis</p> <p><b>D2 - Towards User-Centered Design of a Robotic Prosthetic Hand with EMG Control Interfaces.</b> Velin Dimitrov, Nicholas Cebry, Cagdas Onal, Taskin Padir</p> <p><b>D3 - Nonverbal Communication With a Humanoid Robot Via Head Gestures.</b> Salah Saleh, Karsten Berns</p> <p><b>D4 - Position Paper: Accessible Human-Robot Interaction (AHRI).</b> Claudia Loitsch, Michael Schmidt, Gerhard Weber</p> <p><b>D5 - Development of MERCURY Version 2.0 Robotic Arms for Rehabilitation Applications.</b> Nikolaos Moustakas, Panagiotis Kartsidis, Alkinoos Athanasiou, Alexander Astaras, Panagiotis Bamidis</p> <p><b>D6 - Examples for a Ubiquitous Mobility Assistant as Outcome of the inDAgo Project.</b> Stefanie Müller, Antonija Mrsic Carl, Peter Klein, Henrik Rieß, Denise Bender (Note: Paper presented in Poster Session)</p>	<p><b>Session E. Signal &amp; Image Processing for Ambient Intelligence, Pervasive Computing</b> <b>Session Chair:</b> <i>Eric Larson</i></p> <p><b>E1 - Automatic Soundscape Quality Estimation Using Audio Analysis.</b> Theodoros Giannakopoulos, Georgios Siantikos, Stavros Perantonis, Nefta-Eleftheria Votsi, John Pantis</p> <p><b>E2 - An Interactive and Intuitive STEM Accessibility System for the Blind and Visually Impaired.</b> Rahul Kumar Namdev, Pattie Maes</p> <p><b>E3 - Assistive Positioning System Based Inertial Techniques and Wavelet Denoising.</b> Teodor Lucian Grigorie, Petre Negrea, Ioana Raluca Edu, Felix Constantin Adochiei</p> <p><b>E4 - An Intra-Fraction Markerless Daily Lung Tumor Localization algorithm for EPID images.</b> Timothy Rozario, Sergey Bereg, Weihua Mao</p> <p><b>E5 - Using Dual Camera Smartphones as Advanced Driver Assistance Systems: NAVIEYES System Architecture.</b> Mihai Duguleana, Florin Girbacia, Gheorghe Mogan</p> <p><b>E6 - An Integrated RGB-D System for Looking Up the Meaning of Signs.</b> Christopher Conly, Zhong Zhang, Vassilis Athitsos</p>
16:00-17:30	<p><b>Poster Session Combined with Coffee Break;</b></p> <p><b>Also: <u>1<sup>st</sup> NSF Doctoral Consortium Session</u> (1.5 hours)</b></p>	
20:00	<p><b>Welcome Cocktail Party</b></p>	

SECOND DAY: July 2

	Room 1	Room 2
08:40-10:40	<p><b>Session F. Data Modeling &amp; Information Management for Pervasive Assistive Environments</b>  <b>Session Chair:</b> <i>Theodoros Giannakopoulos</i></p> <p><b>F1 - A Framework for Self-managing Database Support and Parallel Computing for Assistive Systems.</b> Dennis Marten, Andreas Heuer</p> <p><b>F2 - Toward a Platform for Collecting, Mining, and Utilizing Behavior Data for Detecting Students with Depression Risks.</b> Einoshin Suzuki, Yutaka Deguchi, Tetsu Matsukawa, Shin Ando, Hiroaki Ogata, Masanori Sugimoto</p> <p><b>F3 - Generating Privacy Constraints for Assistive Environments.</b> Hannes Grunert, Andreas Heuer</p> <p><b>F4 - An Ontological Approach Towards Psychological Patient Profiling in Pervasive Computing Environments: A case study on Breast Cancer Patients.</b> Irimi Genitsaridi, Manolis Tsiknakis, Kostas Marias</p> <p><b>F5 - Variation in Oxygen Saturation Measurements in Very Low Birth Weight Infants.</b> Olli-Pekka Rinta-Koski, Jaakko Hollmén, Markus Leskinen, Sture Andersson</p>	<p><b>Session G. Tools, Infrastructures, Architectures &amp; Techniques for Deploying Pervasive Applications in Assistive Environments</b>  <b>Session Chair:</b> <i>Oliver Korn</i></p> <p><b>G1 - A Prototype of a Real-Time Solution on Mobile Devices for heart Tele-Auscultation.</b> Julio Cesar Bellido, Giovanna Sannino, Giuseppe De Pietro</p> <p><b>G2 - Sole Based Tactile Information Display for Visually Impaired Pedestrian Navigation.</b> Wahiba Bouhani, Slim Kammoun, Mohamed Jemni</p> <p><b>G3 - Adaptive Music Technology Using the Kinect.</b> Kimberlee Graham-Knight, George Tzanetakis</p> <p><b>G4 - A Multimodal Adaptive Session Manager for Physical Rehabilitation Exercising.</b> Konstantinos Tsiakas, Manfred Huber, Fillia Makedon</p> <p><b>G5 - Self-Managed Patient-Game Interaction Using the Barrett WAM Arm for Motion Analysis.</b> Alexandros Lioulemes, Paul Sassaman, Shawn N. Gieser, Vangelis Karkaletsis, Fillia Makedon, Vangelis Metsis</p>
10:40-10:55	<p><b>Coffee Break (15 min)</b></p>	

SECOND DAY: July 2

<p>10:55 11:50</p>	<p><b>Session H. <u>Invited Lecture</u>: Vassilis Athitsos, “Computer Vision Methods for Human Motion Analysis”</b> <b><u>Session Chair</u>: Panagiotis Papapetrou</b></p>	
<p style="text-align: center;"><b>Room 1</b></p>		<p style="text-align: center;"><b>Room 2</b></p>
<p>11:50- 13:50</p>	<p><b>Session I. Wearable Systems and Monitoring Devices</b> <b><u>Session Chair</u>: Vangelis Metsis</b></p> <p><b>I1 - CapWalk: A Capacitive Recognition of Walking-Based Activities as a Wearable Assistive Technology.</b> Marian Haescher, Denys Matthies, Gerald Bieber, Bodo Urban</p> <p><b>I2 - Human Gait Classification Using a Tri-axial Accelerometer.</b> Ahmad Lotfi, Minh Nguyen, Caroline Langensiepen</p> <p><b>I3 - Sensors Activation Times Prediction in Smart Home.</b> Mohamed Tarik Moutacalli, Abdenour Bouzouane, Bruno Bouchard</p> <p><b>I4 - Performance Characterization of Self-Calibrating Protocols for Wearable EEG Applications.</b> Thrasyvoulos Karydis, Filipe Aguiar, Simmie L. Foster, Andreas Mershin</p> <p><b>I5 - Reliability Assessment in Everyday-Objects Based Physical-Activity Sensing Using Personal Information.</b> Claas Richter</p>	<p><b>Session J. Behavior Modeling, Analysis &amp; Prediction</b> <b><u>Session Chair</u>: George Bebis</b></p> <p><b>J1 - Online Recognition of People’s Activities from Raw GPS Data: Semantic Trajectory Data Analysis.</b> Mehdi Boukhechba, Abdenour Bouzouane, Bruno Bouchard, Charles Gouin-Vallerand, Sylvain Giroux</p> <p><b>J2 - ADOxx Based Tool Support for a Behavior Centered Modeling Approach.</b> Judith Michael, Fadi Al Machot, Heinrich C. Mayr</p> <p><b>J3 - PupilWare: Towards Pervasive Cognitive Load Measurement Using Commodity Devices.</b> Sohail Rafiqi, Chatchai Wangwiwattana, Jasmine Kim, Ephrem Fernandez, Suku Nair, Eric Larson</p> <p><b>J4 - Predicting Multi-Channel ECGs Using Forests of Randomized Shapelet Trees.</b> Isak Karlsson, Panagiotis Papapetrou, Lars Asker</p> <p><b>J5 - A Multimodal Decision Making System for an Ambient Assisted Living Environment.</b> Christos Panagiotou, Theodor Panagiotakopoulos, Achilles Kameas</p>
<p>13:50- 14:50</p>	<p style="text-align: center;"><b>Lunch Break (1 hour)</b></p>	

SECOND DAY: July 2

	Room 1	Room 2
14:30-16:50	<p><b>Session K. Signal and Image Processing for Ambient Intelligence &amp; Pervasive Computing</b>  <b>Session Chair: Sarantos Kapidakis</b></p> <p><b>K1 - A Quantitative Comparison of the Effectiveness of Instructional Visual Stimuli for Therapy Exercise.</b> Paul Sassaman, Shawn N. Gieser</p> <p><b>K2 - A Survey on Vision-Based Fall Detection.</b> Zhong Zhang, Christopher Conly, Vassilis Athitsos</p> <p><b>K3 - HMAGIC: Head Movement And Gaze Input Cascaded Pointing.</b> Andrew Kurauchi, Wenxin Feng, Carlos Morimoto, Margrit Betke</p> <p><b>K4 - A Framework for ECG Denoising For Mobile Devices.</b> Salvatore Cuomo, Ardelio Galletti, Raffaele Farina, Giovanna Sannino, Giuseppe De Pietro</p> <p><b>K5 - Skeleton-Based Human Action Recognition Using Basis Vectors.</b> Stylianos Asteriadis, Petros Daras</p> <p><b>K6 - Thermal Imaging for Active Evacuation Routes.</b> Nikolaos Doulamis, Anastasios Doulamis, Konstantinos Makantasis, Konstantinos Karantzalos, Konstantinos Loupos</p>	<p><b>Session W1. Virtual Reality &amp; Robotic Technologies for Rehabilitation Workshop (VRRTR)</b>  <b>Workshop Chair: Stephanie Carey</b></p> <p><b>W11 - Benchmarking Lower Limb Wearable Robots: Emerging Approaches and Technologies.</b> Diego Torricelli, Antonio J del Ama, Jose Gonzalez, Juan Moreno, Angel Gil, Jose Pons</p> <p><b>W12 - Analysis of Human Stepping Dynamics Using a Wii Balance Board with a Webcam: A Comparison Study.</b> Ismet Handzic, Kyle Reed</p> <p><b>W13 - Eye-Hand Coordination Assessment Method Using a Haptic Virtual Environment with a Complex Valued Neural Networks Training Algorithm.</b> Norali Pernalete, Amar Raheja, Alex Knaack</p> <p><b>W14 - VR4VR: Vocational Rehabilitation of Individuals With Disabilities in Immersive Virtual Reality Environments.</b> Lal Bozgeyikli, Evren Bozgeyikli, Matthew Clevenger, Andrew Raij, Redwan Alqasemi, Rajiv Dubey</p> <p><b>W15 - Development and Evaluation of a Dynamic Virtual Reality Driving Simulator.</b> Sarah Tudor, Stephanie Carey, Rajiv Dubey</p> <p><b>W16 - Simulation Algorithm for the Upper Limb for Better Training and Prosthesis Prescription for Amputees.</b> Dimitrios Menychtas, Stephanie Carey, Rajiv Dubey</p>
16:50-17:50	<b><u>2<sup>nd</sup> NSF Doctoral Consortium Session</u></b>	
21:00	<b>Gala Dinner</b>	

THIRD DAY: July 3

	Room 1	Room 2
9:00-11:00	<p><b>Session L. Tools, Infrastructures, Architectures &amp; Techniques for Deploying Pervasive Applications in Assistive Environments</b></p> <p><b>Session Chair:</b> <i>Peter Christian</i></p> <p><b>L1 - Accessing Virtual Classrooms with Assistive Technologies.</b> Carla Schäkel, Wiebke Köhlmann</p> <p><b>L2 - Intelligent Contextual Data Stream Monitoring.</b> Kostas Kolomvatsos, Christos Anagnostopoulos, Stathes Hadjiefthymiades</p> <p><b>L3 - Cascaded Multimodal Analysis of Alertness Related Features for Drivers Safety Applications.</b> Mohamed Abouelenien, Mihai Burzo, Rada Mihalcea</p> <p><b>L4 - Instrumented Insole for Weight Measurement of Frail People.</b> Eric Campo, Yoann Charlon, Damien Brulin</p> <p><b>L5 - Wireless Sensor Network Deployment for Remote Elderly Care Monitoring.</b> Athanasios Dasios, Damianos Gavalas, Grammati Pantziou, Charalampos Konstantopoulos</p>	<p><b>Session M. Data Modeling and Information Management for Pervasive Assistive Environments</b></p> <p><b>Session Chair:</b> <i>Elisabeth Andre</i></p> <p><b>M1 - Empath2: A Flexible Web and Cloud Based Home Health Care Monitoring System.</b> Robert Dickerson, Enamul Hoque, Ifat Emi, John Stankovic</p> <p><b>M2 - Privacy-Preserving Intelligent Networked Video Surveillance for Patient Monitoring and Alarm Detection.</b> Apostolos Meliones, Simos Kokkovos</p> <p><b>M3 - Frequent Pattern Clustering for ADLs Recognition in Smart Environments.</b> Dany Fortin-Simard, Sebastien Gaboury, Bruno Bouchard, Abdenour Bouzouane</p> <p><b>M4 - Rating Quality in Metadata Harvesting.</b> Sarantos Kapidakis</p> <p><b>M5 - Smart Homes and the Challenges of Data.</b> Kevin Bouchard, Sylvain Giroux</p>
11:00-11:15	<b>Coffee Break (15 min.)</b>	
11:15-12:10	<p><b>Session N. <u>Invited Lecture:</u> Elisabeth Andre, “Enhancing Assistive Environments by Empathic Experiences”</b></p> <p><b>Session Chair:</b> <i>Ilias Maglogiannis</i></p>	
12:10-13:30	<p><b>Session O. Behavior Modeling, Analysis &amp; Prediction</b></p> <p><b>Session Chair:</b> <i>Dimitrios Zikos</i></p> <p><b>O1 - Modelling and Simulation of Activities of Daily Living Representing an Older Adult's Behaviour.</b> Abubaker Elbayoudi, Ahmad Lotfi, Caroline Langensiepen, Kofi Appiah</p> <p><b>O2 - Extracting News Text from Web Pages: an Application for the Visually Impaired.</b> Erik Lundgren, Panagiotis Papapetrou, Lars Asker</p> <p><b>O3 - Abnormal Reaching Behaviour in Virtual Environments: Preliminary Observations.</b> Vaughan Powell, Wendy Powell</p> <p><b>O4 - An Automated Framework For Predicting Obstructive Sleep Apnea Using A Brief, Daytime, Non-Intrusive Test Procedure.</b> Lauren Samy, Paul Macey, Nabil Alshurafa, Majid Sarrafzadeh</p>	<p><b>Session W2. RAsEnv -- Workshop on Robotics for Assistive Environments</b></p> <p><b>Workshop Chair:</b> <i>Dan Popa</i></p> <p><b>W21 - A Two-Step Identification Method for Human-Robot Interaction in Assistive Environments.</b> Alexandros Lioulemes, Nikolaos Sarafianos, Theodoros Giannakopoulos, Vangelis Karkaletsis</p> <p><b>W22 - A Novel EMG-Free Prosthetic Interface System Using Intra-Socket Force Measurement and Pinch Gestures.</b> Joe Sanford, Oguz Yetkin, Sven Cremer, Dan Popa</p> <p><b>W23 - User Adaptable Tasks for Differential Teaching with Applications to Robotic Autism Therapy.</b> Isura Ranatunga, Namrata Balakrishnan, Indika Wijayasinghe, Dan Popa</p>



THIRD DAY: July 3

13:30-14:30	<b>Lunch Break (1 hour)</b>	
14:30-16:30	<p><b>Session W3. Non-Invasive Monitoring Technologies for Disorder Assessment Workshop (SleepMon)</b>  <b>Workshop Chair:</b> <i>Vangelis Metsis</i></p> <p><b>W31 – Monitoring Obstructive Sleep Apnea with Computer-Aided Diagnosis System Using Electrocardiography and 3-Axis Acceleration Sensors.</b> Jong-Ha Lee, Eun-Jin Lee, Yoon-Nyun Kim</p> <p><b>W32 - Non-Invasive Sleep-Environment Monitoring System.</b> Fábio Manoel França Lobato, Bruno Almeida da Silva, Rodrigo de Bem, Diane da Costa Miranda</p> <p><b>W33 - Non-Intrusive Infant Monitoring, Sensor Data Fusion and Tele-Alerting Prototype System (Smart Cot MAIA2).</b> Miltiadis Yfantis, Lilia Raducan, Alexander Astaras</p> <p><b>W34 - Real-Time Subspace Denoising of Polysomnographic Data.</b> Vangelis Metsis, Ioannis Schizas, Gregg Marshall</p> <p><b>W35 - Monitoring Breathing Activity and Sleep Patterns Using Multimodal Non-Invasive Technologies.</b> Michalis Papakostas, James Staud, Fillia Makedon, Vangelis Metsis</p>	<p><b>Session W4. Affective Computing for Biological Activity Recognition in Assistive Environments Workshop (STHENOS)</b>  <b>Workshop Chair:</b> <i>Ilias Maglogiannis, Dimitris Kosmopoulos</i></p> <p><b>W41 - A Novel Hybrid Approach for Human Silhouette Segmentation.</b> Konstantinos Delibasis, Theodosios Goudas, Ilias Maglogiannis</p> <p><b>W42 - Design of a Lifestyle Recommender System for the Elderly: Requirement Gatherings in Germany and Greece.</b> Stephan Hammer, Andreas Seiderer, Elisabeth André, Thomas Rist, Sofia Kastrinaki, Charline Hondrou, Amaryllis Raouzaïou, Kostas Karpouzis, Stefanos Kollias</p> <p><b>W43 - Fall Detection Using History Triple Features.</b> Georgios Goudelis, Georgios Tsatiris, Konstantinos Karpouzis, Stefanos Kollias</p> <p><b>W44 - A Multimodal Adaptive Dialogue Manager for Depressive and Anxiety Disorder Screening: A Wizard-of-Oz Experiment.</b> Konstantinos Tsiakas, Lynette Watts, Cyril Lutterodt, Theodoros Giannakopoulos, Alexandros Papangelis, Robert Gatchel, Vangelis Karkaletsis, Fillia Makedon</p> <p><b>W45 - Joint Segmentation and Classification of Actions Using a Conditional Random Field.</b> Dimitrios Kosmopoulos, Ilias Maglogiannis</p>
16:30-17:30	<p><b>Special NSF CRI Workshop Combined with Coffee Break</b></p> <p><b>“Developing a Multimodal Human Activity Recognition Repository SMART-MOVE”</b>  <b>Chairs:</b> <i>Fillia Makedon, Vassilis Athitsos</i></p> <p>Workshop will be conducted in the form of a panel and discussion open to workshop participants.</p>	
17:30-18:00	<p><b>Conference Closing &amp; Awards Ceremony</b>  <i>Best Technical Paper, Best Paper for Novelty, and Best Student Paper</i></p>	

## Accepted Posters

**P1. Interpretation of Behaviour Evolution in Activities of Daily Living**

Ahmad Lotfi, Caroline Langensiepen, Abubaker Elbayoudi

**P2. Exploiting Future Internet Technologies: The Smart Room Case**

Charilaos Akasiadis, Evaggelos Spyrou, Georgios Pierris, Dimitris Sgouropoulos, Giorgos Siantikos, Alexandros Mavromatis, Costas Vrakopoulos, Theodoros Giannakopoulos

**P3. Flexible Metadata Mapping Using OAI-PMH**

Sarantos Kapidakis, Nikos Houssos, Panagiotis Koutsourakis, Kostas Stamatis

**P4. ifONLY – A Smart Phone App to Capture Unmet Need and Support the Development of New Products for People Living with Long- Term Conditions**

Lisa Austin, Nigel Harris, Christine Sidenko

**P5. Development and Evaluation of a Unity-based, Kinect-controlled Avatar for Physical Rehabilitation**

Dylan Ebert, Vangelis Metsis, Fillia Makedon

**P6. A Novel, Non-Invasive Dermatological Diagnostic Instrument for Skin Resistance Scanning (DermaSense)**

Inessa Kirsanidou, Alexander Zogkas, Christina Kemanetzi, Chrysovalantis Korfitis, Elizabeth Lazaridou, Alexander Astaras

**P7. Monitoring of Compliance on an Individual Treatment Through Mobile Innovations**

Athanasios Anastasiou, Kostas Giokas, Dimitra Iliopoulou, Dimitris Koutsouris

**P8. Mobile-Cloud Platform for Raising Hearing Loss Awareness**

Panagiotis Katakazas, Kostas Giokas, Dimitra Iliopoulou, Dimitris Koutsouris

**P9. Exploring Assistive Technology for Assistance Dog Owners in Emergency Situations**

Charlotte Robinson, Clara Mancini, Janet van der Linden, Lydia Swanson, Claire Guest

**P10. A Framework for the Assessment of Wandering Behavior**

Theodora Toutounzi, Scott Phan, Fillia Makedon

**P11. Large Scale Ebola Detection**

Shyuan Yang, Barry Fine, Ioannis Kymissis

**P12. 3D Mapping of Visual Attention for Smart Rehabilitation**

Christopher McMurrough, Alexandros Lioulemes, Scott Phan, Fillia Makedon

**P13. Self-Calibrating Protocols Enhance Wearable EEG Diagnostics and Consumer Applications**

Thrasylvoulos Karydis, Filipe Aguiar, Simmie Foster, Andreas Mershin

**P14. Robot-Aided Rehabilitation using Force Analysis**

Maher Abujelala, Alexandros Lioulemes, Paul Sassaman, Fillia Makedon

**P15. RF Powered Sleep Apnea Monitoring System**

Vishnoukumaar Sivaji, Dinesh Bhatia, Shalini Prasad

**P16. An Online Learning Approach for Trend Recognition**

David Paulk

**P17. Using Binary Logistic Regression Coefficients for the Dynamic Quantification of Comorbidities**

Dimitrios Zikos, Ismail Vandeliwala

## Program Committee

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