2016 12th International Conference on Intelligent Environments (IE 2016)

London, United Kingdom
14-16 September 2016
Table of Contents

Preface .................................................................................................................................................... x
Organizing Committee .......................................................................................................................... xii
Steering Committee ............................................................................................................................ xiv
Program Committee ........................................................................................................................... xv
Keynotes ............................................................................................................................................... xviii

Regular Papers

A Public Transport Bus as a Flexible Mobile Smart Environment Sensing Platform for IoT ................................................................................................................................. 1
   Lin Kang, Stefan Poslad, Weidong Wang, Xiuhua Li, Yinghai Zhang, and Chaowei Wang

A Qualitative Image Descriptor QIDL+ Applied to Ambient Intelligent Systems .................................................................................................................................................. 9
   Zoe Falomir

A Sharable Wearable Maker Community IoT Application ........................................................................ 16
   Patricia Charlton and Stefan Poslad

An Approach for Autonomous Recalibration of Fingerprinting-Based Indoor Localization Systems ............................................................................................................................ 24
   Ngewi Fet, Marcus Handte, and Pedro José Marrón

Combining Persuasive Computing and User Centered Design into an Energy Awareness System for Smart Houses ...................................................................................................................... 32
   Thomas Vilarinho, Babak Farshchian, Leendert W.M. Wienhofen, Thomas Franang, and Håkon Gulbrandsen

Data Protection Compliance Regulations and Implications for Smart Factories of the Future ................................................................. 40
   Davy Preuveneers, Wouter Joosen, and Elisabeth Ilie-Zudor

Developing a System for Recognizing the Emotional States Using Physiological Devices ................................................................................................................................. 48
   Ali Mehmood Khan and Michael Lawo
Evaluating Future Automation Work in Process Plants with an Experience-Driven Science Fiction Prototype .................................................................54
  Tiina Kymäläinen, Eija Kaasinen, Maiju Aikala, Jaakko Hakulinen, Tomi Heimonen, Hannu Paunonen, Jouni Ruotsalainen, Lauri Lehtikunnas, and Petri Mannonen

Group Interaction through a Multi-modal Haptic Framework .................................................................62
  Hoang H. Le, Martin J. Loomes, and Rui C.V. Loureiro

How Feasible Is WiFi Fingerprint-Based Indoor Positioning for In-Home Monitoring? .................................................................68
  Joaquín Torres, Óscar Belmonte, Raúl Montoliu, Sergio Trilles, and Andrea Calia

Intelligent Integration Framework for Smart Transport System .................................................................76
  Nauman Ahmad Khan, Vesna Brujic-Okretic, and Souheil Khaddaj

Interference Management for Co-channel Mobile Femtocells Technology in LTE Networks .................................................................80
  Rand Raheem, Aboubaker Lasebae, Mahdi Aiash, and Jonathan Loo

Mobile Computing with Near Field Communication (NFC) Smart Objects Applied to Archaeological Research .................................................................88
  Ana M. López, Gloria Fernández, and Francisco Burillo

On-Chip Activity Recognition in a Smart Home .................................................................95
  Dennis Sprute and Matthias König

Real-Time Activity Prediction and Recognition in Smart Homes by Formal Concept Analysis .................................................................103
  Jianguo Hao, Bruno Bouchard, Abdenour Bouzouane, and Sébastien Gaboury

Smart Surface: RFID-Based Gesture Recognition Using k-Means Algorithm .................................................................111
  Raúl Parada, Kamruddin Nur, Joan Melià-Seguí, and Rafael Pous

Special Session on Ambient Intelligence for Elderly or Cognitively Impaired People

A Discrete Event Oriented Framework for a Smart House Behavior Monitor System .................................................................119
  Carlos F. Pfeiffer, Veralia Gabriela Sánchez, and Nils-Olav Skeie

A Quantitative Measure for Meal-Mate Social Capital Networks .................................................................124
  Shiyong Kang and Liping Shen

Detecting Socialization Events in Ageing People: The Experience of the DOREMI Project .................................................................132
  Davide Bacci, Stefano Chessa, Erina Ferro, Luigi Fortunati, Claudio Gallicchio, Davide La Rosa, Miguel Llorente, Alessio Micheli, Filippo Palumbo, Oberdan Parodi, Andrea Valenti, and Federico Vozzi

On-Line Inference Comparison with Markov Logic Network Engines for Activity Recognition in AAL Environments .................................................................136
  Manuel Fernandez-Carmona and Nicola Bellotto
Special Session on Design and Research for Advanced Human Augmentation

Introduction to the Special Session: Design and Research for Advanced Human Augmentation

Tiina Kymäläinen .......................................................................................................................... 144

Comparing Video and Augmented Reality Assistance in Manual Assembly .................................. 147
Frieder Loch, Fabian Quint, and Iuliia Brishtel

Exploring Eye-Tracking-Based Detection of Visual Search for Elderly People .................................. 151
Michael Dietz, Daniel Schork, and Elisabeth André

On-the-Fly Image Classification to Help Blind People ................................................................. 155
Dalal Khalid Aljasem, Michael Heeney, Armando Pesenti Gritti, and Franco Raimondi

Using Optical Head-Mounted Devices (OHMD) for Provision of Feedback in Education .............. 159
Georgios A. Dafoulas, Cristiano Maia, and Martin Loomes

Virtual/Mixed/Augmented Reality Laboratory Research for the Study of Augmented Human and Human-Machine Systems ............................................................... 163
Kaj Helin, Jaakko Karjalainen, Timo Kuula, and Nicolas Philippon

Short and Poster Papers

A Framework for Multi-zone Building Thermal-Electrical Representation ...................................... 167
Sigmundo Preissler Jr., Alexandre Leopoldo Gonçalves, and William Reis Fernandes

A Model for Trustworthy Orchestration in the Internet of Things .................................................. 171
Michele Bottone, Giuseppe Primiero, Franco Raimondi, and Vincenzo De Florio

A Multi-modal Sensor Network to Detect and Monitor Consequential to Knee Injuries .................. 175
Ivan Vatolik, Gordon Hunter, Michael Everington, and Andy T. Augousti

Affect-Aware Intelligent Environment Using Musical Cues as an Emotion Learning Framework ........ 178
Deba Pratim Saha, Brennon C. Bortz, Wei Huang, Thomas L. Martin, and R. Benjamin Knapp

Brain Response to Focal Vibro-Tactile Stimulation Prior to Muscle Contraction ............................ 182
Tijana Jevtic, Aleksandar Zivanovic, and Rui C.V. Loureiro

Combining Occupancy User Profiles in a Multi-user Environment: An Academic Office Case Study ................................................................. 186
Andres Auquilla, Yannick De Bock, Ann Nowé, and Joost Duflou

Combining Speech, Gaze, and Micro-gestures for the Multimodal Control of In-Car Functions .................. 190
Robert Neßelrath, Mohammad Mehdi Moniri, and Michael Feld
Feature Space Analysis for Human Activity Recognition in Smart Environments

Eris Chinellato, David C. Hogg, and Anthony G. Cohn

Incorporating the Driver's Focus of Attention into Automotive Applications in Real Traffic and in Simulator Setups

Mohammad Mehdi Moniri, Dieter Merkel, Michael Feld, and Christian Müller

Intelligent Bio-Environments: Exploring Fuzzy Logic Approaches to the Honeybee Crisis

M. Bassford and B. Painter

Mobile Application to Stimulate Physical Activity in Schoolchildren

Božidara Cvetkovic, Vito Janko, Anton Gradišek, Mitja Luštrek, Tanja Kajtna, and Boro Štrumbelj

MobileSSI - A Multi-modal Framework for Social Signal Interpretation on Mobile Devices

Simon Flutura, Johannes Wagner, Florian Lingenfelser, Andreas Seiderer, and Elisabeth André

Money Handling Training - Applications for Persons with Down Syndrome

Silvia Rus and Andreas Braun

Preliminary Study of Adaptive Decision-Making System for Vocal Command in Smart Home

Alexis Brenon, François Portet, and Michel Vacher

SensingKit: Evaluating the Sensor Power Consumption in iOS Devices

Kleomenis Katevas, Hamed Haddadi, and Laurissa Tokarchuk

Ubiddoo: Embedded Multi-room, Multi-user Tracking

Benjamin Schmitz, Sven Stamm, and Julia Brich

Validation of a Smart Stove for Traumatic Brain Injury Patients in a Cooking Task

Amé Lie Boudreault, Julie Bouchard, Bruno Bouchard, and Shawn Whittom-Ross

Demos and Videos Papers

Hybrid Teams of Humans, Robots, and Virtual Agents in a Production Setting

Tim Schwartz, Michael Feld, Christian Bürckert, Svilen Dimitrov, Joachim Fölz, Dieter Hutter, Peter Hevesi, Bernd Kiefer, Hans-Ulrich Krieger, Christoph Lüth, Dennis Mronga, Gerald Pirkl, Thomas Röfer, Torsten Spieldenner, Malte Wirkus, Ingo Zinnikus, and Sirko Straube

Human Gaze and Focus-of-Attention in Dual Reality Human-Robot Collaboration

Mohammad Mehdi Moniri, Fabio Andres Espinosa Valcarcel, Dieter Merkel, and Daniel Sonntag
Using Smartwatch as Telecare and Fall Detection Device ................................................................. 242
  Hristijan Gjoreski, Jani Bizjak, and Matjaž Gams

**Doctoral Colloquium Papers**

A Framework for Interaction Design in Intelligent Environments ................................................................. 246
  Dario Di Mauro and Francesco Cutugno

Activity Recognition from Video Data Using Spatial and Temporal Features ................................................. 250
  Mohamad Al-Wattar, Rinat Khusainov, Djamel Azzi, and John Chiverton

Enforcing Trust as a Means to Improve Adoption of Connected Wearable Technologies ................................................................. 254
  Farad Rafique Jusob, Carlisle George, and Glenford Mapp

mHealth - Investigating an Information Security Framework for mHealth Data: Challenges and Possible Solutions ................................................................. 258
  Nattaruedee Vithanwattana, Glenford Mapp, and Carlisle George

Progress towards an Intelligent Beehive: Building an Intelligent Environment to Promote the Well-Being of Honeybees ................................................................. 262
  Donald Howard, Gordon Hunter, Olga Duran, and Demetrios Venetsanos

**Author Index** ...................................................................................................................................... 266