Contents

Designing and Developing Intelligent Environments

Visualizing Human-Environment Interactions: Integrating Concepts and Techniques from HCI, Human Factors and Media Psychology .......... 3

Bimal Balakrishnan, Loukas Kalisperis, and Danielle Oprean

Using the GQM Method to Evaluate Calmness in Ubiquitous Applications .......... 13

Rainara M. Carvalho, Rossana M.C. Andrade, and Káthia M. Oliveira

Distributable Interface Design for Web Applications ................. 25

Gianni Fenu and Lucio Davide Spano

The Map as a Tool for Identifying Pervasive Interactions in Today’s Home .............................................. 36

Konstantinos Grivas and Stelios Zerefos

Makers with a Cause: Fabrication, Reflection and Community Collaboration .......................................................... 49

Foad Hamidi and Melanie Baljko

Enabling Programmability of Smart Learning Environments by Teachers .......... 62

Asterios Leonidis, Margherita Antona, and Constantine Stephanidis

Co-creation in Context: The User as Co-creator Approach .................. 74

Ingrid Mulder, Fenne Van Doorn, and Pieter Jan Stappers

Star(t) to Shine: Unlocking Hidden Talents Through Sharing and Making .......... 85

Emilia Louisa Pucci and Ingrid Mulder

A Framework for Navigating Human Behavior Through Gameful Digital Rhetoric .......................................................... 97

Mizuki Sakamoto and Tatsuo Nakajima

Evaluating Ubiquitous Computing Environments Using 3D Simulation .......... 109

Arlindo Santos and Helena Rodrigues

The Transformative Potential of Making in Teacher Education: A Case Study on Teacher Training Through Making and Prototyping .......... 119

Susanna Tesconi and Lucia Arias
Natural Interaction

Brain Signal for Smart Offices .................................................. 131
  Ghada Al-Hudhud, Noha Alrajhi, Nouf Alonaizy, Aysha Al-Mahmoud,
  Latifah Almazrou, and Dalal bin Muribah

Developing and Evaluating Two Gestural-Based Virtual Environment
Navigation Methods for Large Displays ................................... 141
  Paulo Dias, João Parracho, João Cardoso, Beatriz Quintino Ferreira,
  Carlos Ferreira, and Beatriz Sousa Santos

Immersing Users in Landscapes Using Large Scale Displays in Public
Spaces .................................................................................. 152
  Giannis Drossis, Antonios Ntelidakis, Dimitris Grammenos,
  Xenophon Zabulis, and Constantine Stephanidis

A Gesture Recognition Method for Proximity-Sensing Surfaces in Smart
Environments ...................................................................... 163
  Biying Fu, Tobias Grosse-Puppendahl, and Arjan Kuijper

Developing Intuitive Gestures for Spatial Interaction with Large Public
Displays. ................................................................. 174
  Yubo Kou, Yong Ming Kow, and Kelvin Cheng

AR Coloring Jigsaw Puzzles with Texture Extraction and Auto-UV
Mapping Algorithm. .................................................. 182
  Youngho Lee

Smart Kiosk with Gait-Based Continuous Authentication .......... 188
  Duong-Tien Phan, Nhan Nguyen-Trong Dam, Minh-Phuc Nguyen,
  Minh-Triet Tran, and Toan-Thinh Truong

Gesture-Based Configuration of Location Information in Smart
Environments with Visual Feedback ..................................... 201
  Carsten Stocklöw and Martin Majewski

Subjective User Experience and Performance with Active Tangibles
on a Tabletop Interface .................................................. 212
  Jan B.F. van Erp, Alexander Toet, Koos Meijer, Joris Janssen,
  and Arnoud de Jong

Auditory Browsing Interface of Ambient and Parallel Sound Expression
for Supporting One-to-many Communication ....................... 224
  Tomoko Yonezawa
Design and Development of Distributed, Ambient and Pervasive Interactions

Immersiveness of Ubiquitous Computing Environments Prototypes:
A Case Study .................................................. 237

*Tiago Abade, José C. Campos, Rui Moreira, Carlos C.L. Silva, and José Luís Silva*

Employing Virtual Humans for Interaction, Assistance and Information Provision in Ambient Intelligence Environments ........................................ 249

*Chryssi Birliraki, Dimitris Grammenos, and Constantine Stephanidis*

From Collaborative Scenario Recording to Smart Room Assistance Models .............................................. 262

*Gregor Buchholz and Peter Forbrig*

Hierarchical Narrowcasting .......................................................... 274

*Michael Cohen*

Development of a User-Oriented IoT Middleware Architecture Based on Users’ Context Data .......................... 287

*Taehyun Ha, Sangwon Lee, and Narae Kim*

Measuring the Arrangement of Multiple Information Devices by Observing Their User’s Face .......................................................... 296

*Saori Kikutani, Koh Kakusho, Takeshi Okadome, Masaaki Iiyama, and Satoshi Nishiguchi*

SpreadView: A Multi-touch Based Multiple Contents Visualization Method Composed of Aligned Layers .................................................. 305

*Joong Ho Lee, Hyoyoung Kim, and Ji-Hyung Park*

Bandage Man: A Spatial Interaction Design in a Sensible Space for Connecting Family .......................... 317

*Min-Nan Liao and Teng-Wen Chang*

Learning Instead of Markers: Flexible Recognition of Mobile Devices on Interactive Surfaces .......................... 325

*Philipp Mock, Jörg Edelmann, and Wolfgang Rosenstiel*

GlassNage: Layout Recognition for Dynamic Content Retrieval in Multi-Section Digital Signage .......................... 337

*Adiyan Mujibiya*

Manseibashi Reminiscent Window: On-Site AR Exhibition System Using Mobile Devices .......................... 349

*Naoya Okada, Jun Imura, Takuji Narumi, Tomohiro Tanikawa, and Michitaka Hirose*
Crowd Monitoring: Critical Situations Prevention Using Smartphones and Group Detection ................................................................. 496
Joseph El Mallah, Francesco Carrino, Omar Abou Khaled, and Elena Mugellini

Indirect Monitoring of Cared Person by Onomatopoeic Text of Environmental Sound and User’s Physical State ......................... 506
Yusuke Naka, Naoto Yoshida, and Tomoko Yonezawa

Estimating Positions of Students in a Classroom from Camera Images Captured by the Lecturer’s PC ................................................... 518
Junki Nishikawa, Koh Kakusho, Masaaki Iyama, Satoshi Nishiguchi, and Masayuki Murakami

Activity Context Integration in Mobile Computing Environments .............. 527
Yoonsoo Oh

BearWatcher: Animal Motion Estimation Application for Tourism and Welfare .................................................................................. 536
Keni Ren, Jani Hourunranta, Joni Tolonen, and Johannes Karlsson

Children Tracking System in Indoor and Outdoor Places .......................... 547
Mounira Taileb, Wejdan Wajdi, Hind Hamdi, Galia Al-Garni, Sarah Al-Shehri, and Manal Al-Marwani

Smart Cities and Communities

Spending Precious Travel Time More Wisely: A Service Model that Provides Instant Travel Assistance Using Input from Locals ...... 557
Kenro Aihara, Susumu Kono, and Shizuhiro Sugino

Interpreting Food-Venue Visits: Spatial and Social Contexts of Mobile Consumption in Urban Spaces ............................................. 568
Shin’ichi Konomi, Kenta Shoji, and Tomoyo Sasao

Co-design Practice in a Smart City Context Through the Gamification Approach: A Survey About the Most Suitable Applications .... 578
Antonio Opromolla, Valentina Volpi, Andrea Ingrosso, and Carlo Maria Medaglia

Activity Recipe: Spreading Cooperative Outdoor Activities for Local Communities Using Contextual Reminders ......................... 590
Tomoyo Sasao, Shin’ichi Konomi, and Keisuke Kuribayashi

Personalized Energy Reduction Cyber-physical System (PERCS): A Gamified End-User Platform for Energy Efficiency and Demand Response ................................................................. 602
Nicole D. Sintov, Michael D. Orosz, and P. Wesley Schultz
Tou Hsiang Kun – A Platform for Elderly and Neighborhood to Help Each Other ........................................ 614
  Yi-Sin Wu, Teng-Wen Chang, Ying-Ru He, Yi Wang, Wei-Hung Chen, and You-Cheng Zhang

Consumer Concerns About Smart Meters ........................................ 625
  Rani Yesudas and Roger Clarke

**Humor in Ambient Intelligence**

Laughter as the Best Medicine: Exploring Humour-Mediated Health Applications ........................................ 639
  Claire Dormann

An AI for Humorously Reframing Interaction Narratives with Human Users ........................................ 651
  Christian F. Hempelmann and Max Petrenko

Humor Techniques: From Real World and Game Environments to Smart Environments ........................................ 659
  Anton Nijholt

On Algorithmic Discovery and Computational Implementation of the Opposing Scripts Forming a Joke ........................................ 671
  Victor Raskin

Different Knowledge, Same Joke: Response-Based Computational Detection of Humor ........................................ 680
  Julia M. Taylor

Twitter: The Best of Bot Worlds for Automated Wit ........................................ 689
  Tony Veale, Alessandro Valitutti, and Guofu Li

**Author Index** ........................................ 701