KEYNOTE SPEAKERS

Tone Bratteteig
Changing Boundaries of Design and Use .......................................................... 1

Ari Kristinn Jónsson
Developing Interactive Artificial Intelligence Software for NASA Mission Control .......................................................... 1

David Merrill
The New Era of Physical/Digital Play .................................................................. 2

FULL PAPERS

Let’s All Get Up and Walk to the North Pole: Design and Evaluation of a Mobile Wellness Application
Aino Ahtinen, Pertti Huuskonen and Jonna Häkkilä ........................................... 3

Location-based Crowdsourcing: Extending Crowdsourcing to the Real World
Florian Alt, Alireza Sahami Shirazi, Albrecht Schmidt, Urs Kramer and Zahid Nawaz ......................... 13

Analysis of Precedent Designs: Competitive Analysis Meets Genre Analysis
Mattias Arvola, Jonas Lundberg and Stefan Holmlid ........................................ 23

Exploring Distance Encodings with a Tactile Display to Convey Turn by Turn Information in Automobiles
Amna Asif, Wilko Heuten and Susanne Boll .......................................................... 32

Facilitating Continuity: Exploring the Role of Digital Technology in Physical Rehabilitation
Naveen Bagalkot, Elena Nazzi and Tomas Sokoler ............................................. 42

4Photos: A Collaborative Photo Sharing Experience
Martijn ten Bhömer, John Helmes, Kenton O’Hara and Elise van den Hoven ............. 52

Two-Handed Input in a Standard Configuration of Notebook with External Mouse
Florian Block and Hans Gellersen ............................................................................. 62

Tenori-on Stage: YouTube as Performance Space
Mark Blythe and Paul Cairns ..................................................................................... 72

Training Software Developers in Usability Engineering: A Literature Review
Anders Bruun .............................................................................................................. 82

Design and Evaluation of Player Experience of a Location-Based Mobile Game
Tara Carrigy, Katiaryna Naliuka, Natasa Paterson and Mads Haahr ......................... 92

Understanding the Everyday Use of Images on the Web
Boon Chew, Jennifer Rode and Abigail Sellen ....................................................... 102

HCI & Sustainable Food Culture: A Design Framework for Engagement
Jaz Hee-jeong Choi and Eli Blevis ........................................................................... 112

Distributed Usability Evaluation: Enabling Large-scale Usability Evaluation with User-controlled Instrumentation
Lars Christensen and Erik Frøkjær ........................................................................ 118

A Study of Mobile Mood Awareness and Communication through MobiMood
Karen Church, Eve Hoggan and Nuria Oliver ....................................................... 128

Engaging Spect-actors with Multimodal Digital Puppetry
Céline Coutrix, Giulio Jacucci, Anna Spagnolli, Lingyi Ma, Matti Helin, Gabriela Richard, Lorenzo Parisi, Stefano Roveda and Prayag Narula ....... 138
<table>
<thead>
<tr>
<th>Title</th>
<th>Authors</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comparing User Interaction with Low and High Fidelity Prototypes of Tabletop Surfaces</td>
<td>Jan Derboven, Dries De Roeck, Mathijs Verstraete, David Geerts, Jan Schneider Barnes and Kris Luyten</td>
<td>148</td>
</tr>
<tr>
<td>Drop-and-Drag: Easier Drag &amp; Drop on Large Touchscreen Displays</td>
<td>Sebastian Doweling and Urs Glaubitt</td>
<td>158</td>
</tr>
<tr>
<td>Extending Boundaries with Meta-Design and Cultures of Participation</td>
<td>Gerhard Fischer</td>
<td>168</td>
</tr>
<tr>
<td>Wattsup?: Motivating Reductions in Domestic Energy Consumption Using Social Networks</td>
<td>Derek Foster, Shaun Lawson, Mark Blythe and Paul Cairns</td>
<td>178</td>
</tr>
<tr>
<td>Empirical Investigation of Web Design Attributes Affecting Brand Perception</td>
<td>Franca Garzotto, Davide Bolchini, Tao Yang and Fabio Sorce</td>
<td>188</td>
</tr>
<tr>
<td>&quot;Luckily, I don’t need it&quot;: Elderly and the Use of Artifacts for Time Management</td>
<td>Leonardo Giusti, Eleonora Mencarini and Massimo Zancanaro</td>
<td>198</td>
</tr>
<tr>
<td>Studying Mobile Context-aware Social Services in the Wild</td>
<td>Paul Holleis, Sebastian Boehm, Johan Koolwaaiaj and Matthias Wagner</td>
<td>207</td>
</tr>
<tr>
<td>Negotiating Privacy Boundaries in Social Applications for Accessibility Mapping</td>
<td>Harald Holone and Jo Herstad</td>
<td>217</td>
</tr>
<tr>
<td>Transferring Qualities from Horseback Riding to Design</td>
<td>Kristina Höök</td>
<td>226</td>
</tr>
<tr>
<td>Controlling the Use of Collaboration Tools in Open Source Software Development</td>
<td>Heli Ikonen, Netta livari and Henrik Hedberg</td>
<td>236</td>
</tr>
<tr>
<td>Piles, Tabs and Overlaps in Navigation among Documents</td>
<td>Mikkel Ranne Jakobsen and Kasper Hornbæk</td>
<td>246</td>
</tr>
<tr>
<td>Determining Usability Requirements into a Call-for-tenders. A Case Study on the Development of a Healthcare System</td>
<td>Timo Jokela</td>
<td>256</td>
</tr>
<tr>
<td>Descriptive Quality of Experience for Mobile 3D Video</td>
<td>Satu Jumisko-Pyykkö, Dominik Sirohmeier, Timo Utriainen and Kristina Kunze</td>
<td>266</td>
</tr>
<tr>
<td>Unobtrusively Controlling and Linking Information and Services in Smart Environments</td>
<td>Bastian Kriesten, René Tünnermann, Christian Mertes and Thomas Hermann</td>
<td>276</td>
</tr>
<tr>
<td>Evaluating Multimodal Systems - A Comparison of Established Questionnaires and Interaction Parameters</td>
<td>Christine Köhnel, Tilo Westermann, Benjamin Weiss and Sebastian Möller</td>
<td>286</td>
</tr>
<tr>
<td>Rise of the Expert Amateur: DIY Projects, Communities, and Cultures</td>
<td>Stacey Kuznetsov and Eric Paulos</td>
<td>295</td>
</tr>
<tr>
<td>Do People Say What They Think: Social Conformity Behavior in Varying Degrees of Online Social Presence</td>
<td>Lieve Laporte, Christof van Nimwegen and Alex J. Uyttendaele</td>
<td>305</td>
</tr>
<tr>
<td>Using the Hybrid Simulation for Early User Evaluations of Pervasive Interactions</td>
<td>Karin Leichtenstern, Elisabeth André and Matthias Rehm</td>
<td>315</td>
</tr>
<tr>
<td>XTag: Designing an Experience Capturing and Sharing Tool for Persons with Aphasia</td>
<td>Abdullah Al Mahmud, Rikkert Gerits and Jean-Bernard Martens</td>
<td>325</td>
</tr>
<tr>
<td>Pipet: A Design Concept Supporting Photo Sharing</td>
<td>Bernt Meerbeek, Peter Bingley, Wil Rijnen and Elise van den Hoven</td>
<td>335</td>
</tr>
<tr>
<td>Title</td>
<td>Authors</td>
<td></td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>User Experience (UX) Patterns for Audio-Visual Networked Applications: Inspirations for Design</td>
<td>Marianna Obrist, Daniela Wurhofer, Elke Beck, Amelia Karahasansovic and Manfred Tscheligi</td>
<td></td>
</tr>
<tr>
<td>Collective Interaction by Design - Collective Controllers for Social Navigation on Digital Photos</td>
<td>Marianne Graves Petersen, Peter Gall Krogh, Morten Boye Mortensen, Thomas Møller Lassen and Ditte Hvas Mortensen</td>
<td></td>
</tr>
<tr>
<td>Privacy-Awareness Information for Web Forums: Results from an Empirical Study</td>
<td>Stefanie Pötzsch, Peter Wolkerstorfer and Cornelia Graf</td>
<td></td>
</tr>
<tr>
<td>Tactile Camera vs. Tangible Camera: Taking Advantage of Small Physical Artefacts to Navigate into Large Data Collection</td>
<td>Mathieu Raynal, Guillaume Gauffre, Cédric Bach, Bénédicte Schmitt and Emmanuel Dubois</td>
<td></td>
</tr>
<tr>
<td>Five Design Challenges for Human Computation</td>
<td>Stuart Reeves and Scott Sherwood</td>
<td></td>
</tr>
<tr>
<td>Designing for Crowds</td>
<td>Stuart Reeves, Scott Sherwood and Barry Brown</td>
<td></td>
</tr>
<tr>
<td>Mobile Interaction with Real-Time Geospatial Data by Pointing Through Transparent Earth</td>
<td>Erika Reponen and Jaakko Keränen</td>
<td></td>
</tr>
<tr>
<td>Lightweight Personal Sensemaking Tools for the Web</td>
<td>Brendan Ryder and Terry Anderson</td>
<td></td>
</tr>
<tr>
<td>The Effect of Aesthetically Pleasing Composition on Visual Search Performance</td>
<td>Carolyn Salimun, Helen C Purchase, David R Simmons and Stephen Brewster</td>
<td></td>
</tr>
<tr>
<td>HandsDown: Hand-contour-based User Identification for Interactive Surfaces</td>
<td>Dominik Schmidt, Ming Ki Chong and Hans Gellersen</td>
<td></td>
</tr>
<tr>
<td>ExoBuilding - Breathing Life into Architecture</td>
<td>Holger Schnädelsbach, Kevin Glover and Ainojie Alexander Irune</td>
<td></td>
</tr>
<tr>
<td>Sustainable Energy Practices at Work: Understanding the Role of Workers in Energy Conservation</td>
<td>Tobias Schwartz, Matthias Betz, Leonardo Ramirez and Gunnar Stevens</td>
<td></td>
</tr>
<tr>
<td>Body-Centric Interaction Techniques for Very Large Wall Displays</td>
<td>Garth Shoemaker, Takayuki Tsukitani, Yoshihumi Kitamura and Kellogg S. Booth</td>
<td></td>
</tr>
<tr>
<td>From Product Concept to User Experience: Exploring UX Potentials at Early Product Stages</td>
<td>Sandra Sproll, Matthias Peissner and Christina Sturm</td>
<td></td>
</tr>
<tr>
<td>Electronic Resource Discovery Systems: From User Behaviour to Design</td>
<td>Hanna Stelmaszewska, B.L. William Wong, Simon Attfield and Raymond Chen</td>
<td></td>
</tr>
<tr>
<td>Design Qualities for Whole Body Interaction - Learning from Golf, Skateboarding and BodyBugging</td>
<td>Jakob Tholander and Carolina Johansson</td>
<td></td>
</tr>
<tr>
<td>A Case Study: The Impact of Using Location-Based Services with a Behaviour-Disordered Child</td>
<td>Lisa Thomas, Pam Briggs and Linda Little</td>
<td></td>
</tr>
<tr>
<td>Eyes-free Text Entry with Error Correction on Touchscreen Mobile Devices</td>
<td>Hussain Tinwala and Ian Scott MacKenzie</td>
<td></td>
</tr>
<tr>
<td>Family Storytelling for Grandparents and Grandchildren Living Apart</td>
<td>René Vutborg, Jesper Kjeldskov, Sonja Pedell and Frank Vetere</td>
<td></td>
</tr>
</tbody>
</table>
### Table of Contents

**Supporting Cooperative Design through “Living” Artefacts**
Dhaval Vyas, Anton Nijholt and Gerrit van der Veer ................................. 541

**Crowdsourcing Human-Based Computation**
Doug Wightman ........................................................................................................ 551

**Curve: Revisiting the Digital Desk**
Raphael Wimmer, Fabian Hennecke, Florian Schulz, Sebastian Boring, Andreas Butz and Heinrich Hußmann .................. 561

**How to Stay in the Emotional Rollercoaster: Lessons Learnt from Designing EmRoll**
Farnaz Zangouei, Mohammad Ali Babazadeh Gashti, Kristina Höök, Tim Tijs, Gert-Jan de Vries and Joyce Westerink ...... 571

**Keep Talking: An Analysis of Participant Utterances Gathered Using Two Concurrent Think-aloud Methods**
Tingting Zhao and Sharon McDonald ................................................................. 581

### Short Papers

**tacTiles - A Low-Cost Modular Tactile Sensing System for Floor Interactions**
Jan Anlauff, Tobias Grosshauser and Thomas Hermann ..................................... 591

**Interaction Design Qualities: Theory and Practice**
Mattias Arvola ....................................................................................................... 595

**Virtual Fashion and Avatar Design: A Survey of Consumers and Designers**
Jeffrey Bardzell, Tyler Pace and Jennifer Terrell ................................................ 599

**Space-Multiplexed Input on Mouse-Extended Notebooks**
Florian Block and Hans Gellersen ....................................................................... 603

**The Impact of Cognitive Load on the Perception of Time**
Florian Block and Hans Gellersen ....................................................................... 607

**Experiencing the Non-Sensuous: On Measurement, Representation and Conception in Urban Art Installations**
Morten Breinbjerg, Morten S. Riis, Tobias Ebsen and Rasmus B. Lunding .......... 611

**DisQo: A User Needs Analysis Method for Smart Home**
Joëlle Coutaz, Emeric Fontaine, Nadine Mandran and Alexandre Demeure .... 615

**User Perception of Interruptions in Multimedia Annotation Tasks**
Chris Creed, Chris Bowers, Robert Hendley and Russell Beale ......................... 619

**Seeking a Theoretical Foundation for Design of In Sitro Usability Assessments**
Yngve Dahl ........................................................................................................... 623

**Why do Users Communicate via such or such Media? Some Insights from Users’ Daily Experiences**
Françoise Détienne, Béatrice Cahour and Liv Lefebvre ..................................... 627

**The Impact of Concept (Re)presentation on Users’ Evaluation and Perception**
Sarah Diefenbach, Marc Hassenzahl, Kai Eckoldt and Matthias Laschke .......... 631

**Exploration of Direct Bi-manual Interaction in Digitally Mediated Stop-motion Animation**
Mariza Dima, John Lee and Mark Wright .......................................................... 635

**Choosing Field Methods: A Reflection on a RepGrid Study**
Helen M. Edwards, Sharon McDonald and S. Michelle Young ......................... 639

**Mementos: A Tangible Interface Supporting Travel**
Augusto Esteves and Ian Oakley ......................................................................... 643
Table of Contents

Proceedings: NordiCHI 2010, October 16–20, 2010

Analysis in Usability Evaluations: an Exploratory Study
Asbjørn Følstad, Effie Lai-Chong Law and Kasper Hornbæk .......................................................... 647

Pocket Bee - A Multi-modal Diary for Field Research
Jens Gerken, Stefan Dierdorf, Patric Schmid, Alexandra Sautner and Harald Reiterer ......................... 651

SmarterPhone – Supporting Meetings in a Mobile Context
Humberto Glória, Tiago Guerreiro and Daniel Gonçalves ................................................................. 655

Evaluating Game Genres for Tagging Images
Dion H. Goh, Rebecca P. Ang, Alton Y.K. Chua and Chei Sian Lee .................................................... 659

Designing a Personal Information Visualization Tool
Paulo Gomes, Sandra Gama and Daniel Gonçalves .......................................................... 663

The City at Hand: Media Installations as Urban Information Systems
Roland Haring, Hideaki Ogawa, Christopher Lindinger, Horst Hörtner, Shervin Afshar and David Stolarsky .......... 667

Take me by the Hand: Haptic Compasses in Mobile Devices through Shape Change and Weight Shift
Fabian Hemmert, Susann Hamann, Matthias Löwe, Anne Wohlauf, Josefine Zeipelt and Gesche Joost ............... 671

Experiments in the Wild: Public Evaluation of Off-Screen Visualizations in the Android Market
Niels Henze, Benjamin Poppinga and Susanne Boll ........................................................................ 675

TilePix: An Exploratory Interface to Astronomical Image Databases
Avon Huxor and Steve Phillipps ........................................................................................................ 679

Motor Efficiency of Text Entry in a Combination of a Soft Keyboard and Unistrokes
Poika Isokoski, Benoît Martin, Paul Gandouly and Thomas Stephanov ........................................... 683

Prototyping iPhone Apps: Realistic Experiences on the Device
Anders P. Jørgensen, Matthijs Collard and Christian Koch .................................................................. 687

Onto-Frogger: The Making Of
Amalia Kallergi and Fons J. Verbeek ..................................................................................................... 691

Politics at the Interface - A Foucauldian Power Analysis
Gopinath Kannabiran and Marianne Petersen ....................................................................................... 695

Thumbs-Up Scale and Frequency of Use Scale for Use in Self Reporting of Children's Computer Experience
Akiyo Kano, Matthew Horton and Janet C Read .................................................................................. 699

EcolIsland: A Persuasive Application to Motivate Sustainable Behavior in Collectivist Cultures
Hiroaki Kimura and Tatsuo Nakajima ................................................................................................... 703

Comprehending Parametric CAD Models: An Evaluation of Two Graphical User Interfaces
Sinisa Kolaric, Halil Erhan, Robert Woodbury and Bernhard E. Riecke .................................................. 707

Are Human-Computer Interaction Design Patterns Really Used?
Christian Kruschitz and Martin Hitz ....................................................................................................... 711

Where are the Ionians of User Experience Research?
Kari Kuutti ............................................................................................................................................... 715

To what Extent Usability Truly Matters? A Study on Usability Requirements in Call-for-tenders of Software Systems Issued by Public Authorities
Taina Lehtonen, Juha Kumpulainen, Timo Jokela and Tapani Liukkonen ............................................. 719

Blue-Sky and Down-to-Earth: How Analogous Practices can Support the User-centred Design Process
Sara Ljungblad and Clint Heyer ............................................................................................................. 723
# Table of Contents

## GappaGoshti™ – A Social Networking Platform for Information Dissemination in the Rural World
Sylvan Lobo, Pankaj Doke and Sanjay Kimbahune ................................................................. 727

## PINwl - Pedestrian Indoor Navigation without Infrastructure
Markus Löchtefeld, Sven Gehring, Johannes Schöning and Antonio Krüger ................................................................. 731

## Pointing for Non-visual Orientation and Navigation
Charlotte Magnusson, Miguel Molina, Kirsten Rassmus-Grohn and Delphine Szymczak ................................................................. 735

## Mobile or Desktop Websites? Website Usage on Multitouch Devices
Max-Emanuel Maurer, Doris Hausen, Alexander De Luca and Heinrich Hussmann ................................................................. 739

## Venice Unfolding: A Tangible User Interface for Exploring Faceted Data in a Geographical Context
Till Nagel, Frank Heidmann, Massimiliano Condotta and Erik Duval ................................................................. 743

## DESIGNi – A Workbench for Supporting Interaction Design
Claudia Nass, Kerstin Klöckner, Sarah Diefenbach and Marc Hassenzahl ................................................................. 747

## What makes a Butlerbot a Butlerbot? A Discussion of a Robot Classification System
Mie Norgaard .......................................................................................................................... 751

## Towards a Model for Egocentric Interaction with Physical and Virtual Objects
Thomas Pederson, Lars-Erik Janlert and Dipak Surie .............................................................................. 755

## Visualizing the Text of Philip Pullman’s Trilogy “His Dark Materials”
Tim Regan and Linda Becker ..................................................................................................... 759

## Teaching UbiComp with Sense
Mike Richards and Neil Smith ....................................................................................................... 765

## Introducing Co-design for Digital Technologies in Rural Areas
Fausto Sainz, Nacho Madrid and Jaisiel Madrid .............................................................................. 769

## PyGml – Creation and Evaluation of a Portable Gestural Interface
Matthias Schwaller, Denis Lalanne and Omar Abou Khaled .............................................................................. 773

## Capital Music – Personal Expression with a Public Display of Song Choice
Jan Seeburger, Marcus Foth and Dian Tjondronegoro .............................................................................. 777

## Research Methods for Involving Hearing Impaired Children in IT Innovation
Karín Slegers, Pieter Duysburgh and An Jacobs .............................................................................. 781

## Evaluation of Adaptive SpringLens – a Multi-focus Interface for Exploring Multimedia Collections
Sebastian Stober, Christian Hentschel and Andreas Nuernberger .............................................................................. 785

## Measuring Effects of Private and Shared Displays in Small-Group Knowledge Sharing Processes
Sara Streng, Karsten Stegmann, Sebastian Boring, Sonja Böhm, Frank Fischer and Heinrich Hussmann .............................................................................. 789

## Mobile Device Interaction Gestures for Older Users
Christian Stöbel and Lucienne Blessing .............................................................................. 793

## Messenger Visual: A Pictogram-based IM Service to Improve Communications Among Disabled People
Pere Tusell, Pere Barberà, Léonard Janer, Esteve Buscà, Sandra Delgado and Nuria Vilà .............................................................................. 797

## From Magical Experience to Effortlessness: An Exploration of the Components of Intuitive Interaction
Daniel Ullrich and Sarah Diefenbach .............................................................................. 801

## Role Playing with Fire Fighters – Using a Worst Case Scenario and Verbal Re-enactment in the Role Play
Paula Valkonen and Marja Liinasuo .............................................................................. 805

## Gesture Based Interaction for Visually-Impaired People
Sylvie Vidal and Grégoire Lefebvre .............................................................................. 809
Bridging Gaps with Pointer Warping in Multi-Display Environments
Manuela Waldner, Ernst Kruijff and Dieter Schmalstieg ................................................................. 813

Detecting the “Point of Originality” in Student Writing
Brandon White and Johann Ari Larusson ............................................................................................... 817

Architectures of Interaction: An Architectural Perspective on Digital Experience
Heather Wiltse and Erik Stolterman ....................................................................................................... 821

Measuring the Dynamics of User Experience in Short Interaction Sequences
Benjamin Wimmer, Bernhard Wockl, Michael Leitner and Manfred Tscheligi ....................................... 825

Design and Interactive Demonstrations

UCD Method Selection with Usability Planner
Xavier Ferre, Nigel Bevan and Tomás Antón Escobar ........................................................................... 829

HawkEye: a novel process automation interface
Kristoffer Husey and Torgeir Enkerud .................................................................................................... 831

Temporal Relations in Affective Health
Elsa Kosmack-Vaara, Iuliana Claudia Silviașan, Anna Ståhl and Kristina Hőök ....................................... 833

linked. -- A Relatedness Experience for Boys
Matthias Laschke, Marc Hassenzahl and Kurt Mehnert ........................................................................ 839

Exploratory Study of a Touch-based Gestural Interface for Elderly
Chiara Leonardi, Adriano Albertini, Fabio Pianesi and Massimo Zancanaro ........................................ 845

Bringing Playfulness to Disabilities
Patrizia Marti ........................................................................................................................................... 851

Untangling the Mess - A Redesign of a Technical Environment for a Telecommunication Company Call Centre. Part II: Capturing a Valid Order for a Telecommunication Service
Margret Dora Ragnarsdottir ................................................................................................................... 857

Panel

Grand Challenges for Future HCI Research: Cultures of Participation, Interfaces Supporting Learning, and Expansive Learning
Yrjö Engeström, Annalisa Sannino, Gerhard Fischer and Anders I. Mørch ........................................... 863

Author Index ........................................................................................................................................... 867