

Commenced Publication in 1973

Founding and Former Series Editors:

Gerhard Goos, Juris Hartmanis, and Jan van Leeuwen

Editorial Board

David Hutchison

Lancaster University, UK

Takeo Kanade

Carnegie Mellon University, Pittsburgh, PA, USA

Josef Kittler

University of Surrey, Guildford, UK

Jon M. Kleinberg

Cornell University, Ithaca, NY, USA

Alfred Kobsa

University of California, Irvine, CA, USA

Friedemann Mattern

ETH Zurich, Switzerland

John C. Mitchell

Stanford University, CA, USA

Moni Naor

Weizmann Institute of Science, Rehovot, Israel

Oscar Nierstrasz

University of Bern, Switzerland

C. Pandu Rangan

Indian Institute of Technology, Madras, India

Bernhard Steffen

TU Dortmund University, Germany

Madhu Sudan

Microsoft Research, Cambridge, MA, USA

Demetri Terzopoulos

University of California, Los Angeles, CA, USA

Doug Tygar

University of California, Berkeley, CA, USA

Gerhard Weikum

Max Planck Institute for Informatics, Saarbruecken, Germany

Masaaki Kurosu (Ed.)

Human Centered Design

Second International Conference, HCD 2011
Held as Part of HCI International 2011
Orlando, FL, USA, July 9-14, 2011
Proceedings

Volume Editor

Masaaki Kurosu
The Open University of Japan
2-11 Wakaba, Mihama-ku, Chiba-shi, Chiba 261-8586 Japan
E-mail: masaakikurosu@spa.nifty.com

ISSN 0302-9743 e-ISSN 1611-3349
ISBN 978-3-642-21752-4 e-ISBN 978-3-642-21753-1
DOI 10.1007/978-3-642-21753-1
Springer Heidelberg Dordrecht London New York

Library of Congress Control Number: 2011929164

CR Subject Classification (1998): H.5.2, H.5, H.3-4, C.2, K.4, D.2, K.6

LNCS Sublibrary: SL 3 – Information Systems and Application, incl. Internet/Web and HCI

© Springer-Verlag Berlin Heidelberg 2011

This work is subject to copyright. All rights are reserved, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, re-use of illustrations, recitation, broadcasting, reproduction on microfilms or in any other way, and storage in data banks. Duplication of this publication or parts thereof is permitted only under the provisions of the German Copyright Law of September 9, 1965, in its current version, and permission for use must always be obtained from Springer. Violations are liable to prosecution under the German Copyright Law.

The use of general descriptive names, registered names, trademarks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

Typesetting: Camera-ready by author, data conversion by Scientific Publishing Services, Chennai, India

Printed on acid-free paper

Springer is part of Springer Science+Business Media (www.springer.com)

Foreword

The 14th International Conference on Human–Computer Interaction, HCI International 2011, was held in Orlando, Florida, USA, July 9–14, 2011, jointly with the Symposium on Human Interface (Japan) 2011, the 9th International Conference on Engineering Psychology and Cognitive Ergonomics, the 6th International Conference on Universal Access in Human–Computer Interaction, the 4th International Conference on Virtual and Mixed Reality, the 4th International Conference on Internationalization, Design and Global Development, the 4th International Conference on Online Communities and Social Computing, the 6th International Conference on Augmented Cognition, the Third International Conference on Digital Human Modeling, the Second International Conference on Human-Centered Design, and the First International Conference on Design, User Experience, and Usability.

A total of 4,039 individuals from academia, research institutes, industry and governmental agencies from 67 countries submitted contributions, and 1,318 papers that were judged to be of high scientific quality were included in the program. These papers address the latest research and development efforts and highlight the human aspects of design and use of computing systems. The papers accepted for presentation thoroughly cover the entire field of human–computer interaction, addressing major advances in knowledge and effective use of computers in a variety of application areas.

This volume, edited by Masaaki Kurosu, contains papers in the thematic area of human centered design (HCD), addressing the following major topics:

- Human centered design methods and tools
- Mobile and ubiquitous interaction
- Human centered design in health and rehabilitation applications
- Human centered design in work, business and education
- Applications of human centered design

The remaining volumes of the HCI International 2011 Proceedings are:

- Volume 1, LNCS 6761, Human–Computer Interaction—Design and Development Approaches (Part I), edited by Julie A. Jacko
- Volume 2, LNCS 6762, Human–Computer Interaction—Interaction Techniques and Environments (Part II), edited by Julie A. Jacko
- Volume 3, LNCS 6763, Human–Computer Interaction—Towards Mobile and Intelligent Interaction Environments (Part III), edited by Julie A. Jacko
- Volume 4, LNCS 6764, Human–Computer Interaction—Users and Applications (Part IV), edited by Julie A. Jacko
- Volume 5, LNCS 6765, Universal Access in Human–Computer Interaction—Design for All and eInclusion (Part I), edited by Constantine Stephanidis
- Volume 6, LNCS 6766, Universal Access in Human–Computer Interaction—Users Diversity (Part II), edited by Constantine Stephanidis

- Volume 7, LNCS 6767, Universal Access in Human–Computer Interaction—Context Diversity (Part III), edited by Constantine Stephanidis
- Volume 8, LNCS 6768, Universal Access in Human–Computer Interaction—Applications and Services (Part IV), edited by Constantine Stephanidis
- Volume 9, LNCS 6769, Design, User Experience, and Usability—Theory, Methods, Tools and Practice (Part I), edited by Aaron Marcus
- Volume 10, LNCS 6770, Design, User Experience, and Usability—Understanding the User Experience (Part II), edited by Aaron Marcus
- Volume 11, LNCS 6771, Human Interface and the Management of Information—Design and Interaction (Part I), edited by Michael J. Smith and Gavriel Salvendy
- Volume 12, LNCS 6772, Human Interface and the Management of Information—Interacting with Information (Part II), edited by Gavriel Salvendy and Michael J. Smith
- Volume 13, LNCS 6773, Virtual and Mixed Reality—New Trends (Part I), edited by Randall Shumaker
- Volume 14, LNCS 6774, Virtual and Mixed Reality—Systems and Applications (Part II), edited by Randall Shumaker
- Volume 15, LNCS 6775, Internationalization, Design and Global Development, edited by P.L. Patrick Rau
- Volume 17, LNCS 6777, Digital Human Modeling, edited by Vincent G. Duffy
- Volume 18, LNCS 6778, Online Communities and Social Computing, edited by A. Ant Ozok and Panayiotis Zaphiris
- Volume 19, LNCS 6779, Ergonomics and Health Aspects of Work with Computers, edited by Michelle M. Robertson
- Volume 20, LNAI 6780, Foundations of Augmented Cognition: Directing the Future of Adaptive Systems, edited by Dylan D. Schmorrow and Cali M. Fidopiastis
- Volume 21, LNAI 6781, Engineering Psychology and Cognitive Ergonomics, edited by Don Harris
- Volume 22, CCIS 173, HCI International 2011 Posters Proceedings (Part I), edited by Constantine Stephanidis
- Volume 23, CCIS 174, HCI International 2011 Posters Proceedings (Part II), edited by Constantine Stephanidis

I would like to thank the Program Chairs and the members of the Program Boards of all Thematic Areas, listed herein, for their contribution to the highest scientific quality and the overall success of the HCI International 2011 Conference.

In addition to the members of the Program Boards, I also wish to thank the following volunteer external reviewers: Roman Vilimek from Germany, Ramalingam Ponnusamy from India, Si Jung “Jun” Kim from the USA, and Ilia Adami, Iosif Kironomos, Vassilis Kouroumalis, George Margetis, and Stavroula Ntoa from Greece.

This conference would not have been possible without the continuous support and advice of the Conference Scientific Advisor, Gavriel Salvendy, as well as the dedicated work and outstanding efforts of the Communications and Exhibition Chair and Editor of HCI International News, Abbas Moallem.

I would also like to thank for their contribution toward the organization of the HCI International 2011 Conference the members of the Human-Computer Interaction Laboratory of ICS-FORTH, and in particular Margherita Antona, George Paparoulis, Maria Pitsoulaki, Stavroula Ntoa, Maria Bouhli and George Kapnas.

July 2011

Constantine Stephanidis

Organization

Ergonomics and Health Aspects of Work with Computers

Program Chair: Michelle M. Robertson

Arne Aarås, Norway

Pascale Carayon, USA

Jason Devereux, UK

Wolfgang Friesdorf, Germany

Martin Helander, Singapore

Ed Israelski, USA

Ben-Tzion Karsh, USA

Waldemar Karwowski, USA

Peter Kern, Germany

Danuta Koradecka, Poland

Nancy Larson, USA

Kari Lindström, Finland

Brenda Lobb, New Zealand

Holger Luczak, Germany

William S. Marras, USA

Aura C. Matias, Philippines

Matthias Rötting, Germany

Michelle L. Rogers, USA

Dominique L. Scapin, France

Lawrence M. Schleifer, USA

Michael J. Smith, USA

Naomi Swanson, USA

Peter Vink, The Netherlands

John Wilson, UK

Human Interface and the Management of Information

Program Chair: Michael J. Smith

Hans-Jörg Bullinger, Germany

Alan Chan, Hong Kong

Shin'ichi Fukuzumi, Japan

Jon R. Gunderson, USA

Michitaka Hirose, Japan

Jhilmil Jain, USA

Yasufumi Kume, Japan

Mark Lehto, USA

Hirohiko Mori, Japan

Fiona Fui-Hoon Nah, USA

Shogo Nishida, Japan

Robert Proctor, USA

Youngho Rhee, Korea

Anxo Cereijo Roibás, UK

Katsunori Shimohara, Japan

Dieter Spath, Germany

Tsutomu Tabe, Japan

Alvaro D. Taveira, USA

Kim-Phuong L. Vu, USA

Tomio Watanabe, Japan

Sakae Yamamoto, Japan

Hidekazu Yoshikawa, Japan

Li Zheng, P. R. China

Human–Computer Interaction

Program Chair: Julie A. Jacko

Sebastiano Bagnara, Italy	Gitte Lindgaard, Canada
Sherry Y. Chen, UK	Chen Ling, USA
Marvin J. Dainoff, USA	Yan Liu, USA
Jianming Dong, USA	Chang S. Nam, USA
John Eklund, Australia	Celestine A. Ntuen, USA
Xiaowen Fang, USA	Philippe Palanque, France
Ayse Gurses, USA	P.L. Patrick Rau, P.R. China
Vicki L. Hanson, UK	Ling Rothrock, USA
Sheue-Ling Hwang, Taiwan	Guangfeng Song, USA
Wonil Hwang, Korea	Steffen Staab, Germany
Yong Gu Ji, Korea	Wan Chul Yoon, Korea
Steven A. Landry, USA	Wenli Zhu, P.R. China

Engineering Psychology and Cognitive Ergonomics

Program Chair: Don Harris

Guy A. Boy, USA	Jan M. Noyes, UK
Pietro Carlo Cacciabue, Italy	Kjell Ohlsson, Sweden
John Huddleston, UK	Axel Schulte, Germany
Kenji Itoh, Japan	Sarah C. Sharples, UK
Hung-Sying Jing, Taiwan	Neville A. Stanton, UK
Wen-Chin Li, Taiwan	Xianghong Sun, P.R. China
James T. Luxhøj, USA	Andrew Thatcher, South Africa
Nicolas Marmaras, Greece	Matthew J.W. Thomas, Australia
Sundaram Narayanan, USA	Mark Young, UK
Mark A. Neerincx, The Netherlands	Rolf Zon, The Netherlands

Universal Access in Human–Computer Interaction

Program Chair: Constantine Stephanidis

Julio Abascal, Spain	Michael Fairhurst, UK
Ray Adams, UK	Dimitris Grammenos, Greece
Elisabeth André, Germany	Andreas Holzinger, Austria
Margherita Antona, Greece	Simeon Keates, Denmark
Chieko Asakawa, Japan	Georgios Kouroupetroglou, Greece
Christian Bühler, Germany	Sri Kurniawan, USA
Jerzy Charytonowicz, Poland	Patrick M. Langdon, UK
Pier Luigi Emiliani, Italy	Seongil Lee, Korea

Zhengjie Liu, P.R. China
 Klaus Miesenberger, Austria
 Helen Petrie, UK
 Michael Pieper, Germany
 Anthony Savidis, Greece
 Andrew Sears, USA
 Christian Stary, Austria

Hirotsada Ueda, Japan
 Jean Vanderdonckt, Belgium
 Gregg C. Vanderheiden, USA
 Gerhard Weber, Germany
 Harald Weber, Germany
 Panayiotis Zaphiris, Cyprus

Virtual and Mixed Reality

Program Chair: Randall Shumaker

Pat Banerjee, USA
 Mark Billinghurst, New Zealand
 Charles E. Hughes, USA
 Simon Julier, UK
 David Kaber, USA
 Hirokazu Kato, Japan
 Robert S. Kennedy, USA
 Young J. Kim, Korea
 Ben Lawson, USA
 Gordon McK Mair, UK

David Pratt, UK
 Albert “Skip” Rizzo, USA
 Lawrence Rosenblum, USA
 Jose San Martin, Spain
 Dieter Schmalstieg, Austria
 Dylan Schmorrow, USA
 Kay Stanney, USA
 Janet Weisenford, USA
 Mark Wiederhold, USA

Internationalization, Design and Global Development

Program Chair: P.L. Patrick Rau

Michael L. Best, USA
 Alan Chan, Hong Kong
 Lin-Lin Chen, Taiwan
 Andy M. Dearden, UK
 Susan M. Dray, USA
 Henry Been-Lirn Duh, Singapore
 Vanessa Evers, The Netherlands
 Paul Fu, USA
 Emilie Gould, USA
 Sung H. Han, Korea
 Veikko Ikonen, Finland
 Toshikazu Kato, Japan
 Esin Kiris, USA
 Apala Lahiri Chavan, India

James R. Lewis, USA
 James J.W. Lin, USA
 Rungtai Lin, Taiwan
 Zhengjie Liu, P.R. China
 Aaron Marcus, USA
 Allen E. Milewski, USA
 Katsuhiko Ogawa, Japan
 Oguzhan Ozcan, Turkey
 Girish Prabhu, India
 Kerstin Röse, Germany
 Supriya Singh, Australia
 Alvin W. Yeo, Malaysia
 Hsiu-Ping Yueh, Taiwan

Online Communities and Social Computing

Program Chairs: A. Ant Ozok, Panayiotis Zaphiris

Chadia N. Abras, USA	Anthony F. Norcio, USA
Chee Siang Ang, UK	Ulrike Pfeil, UK
Peter Day, UK	Elaine M. Raybourn, USA
Fiorella De Cindio, Italy	Douglas Schuler, USA
Heidi Feng, USA	Gilson Schwartz, Brazil
Anita Komlodi, USA	Laura Slaughter, Norway
Piet A.M. Kommers, The Netherlands	Sergei Stafeev, Russia
Andrew Laghos, Cyprus	Asimina Vasalou, UK
Stefanie Lindstaedt, Austria	June Wei, USA
Gabriele Meiselwitz, USA	Haibin Zhu, Canada
Hideyuki Nakanishi, Japan	

Augmented Cognition

Program Chairs: Dylan D. Schmorow, Cali M. Fidopiastis

Monique Beaudoin, USA	Rob Matthews, Australia
Chris Berka, USA	Dennis McBride, USA
Joseph Cohn, USA	Eric Muth, USA
Martha E. Crosby, USA	Mark A. Neerincx, The Netherlands
Julie Drexler, USA	Denise Nicholson, USA
Ivy Estabrooke, USA	Banu Onaral, USA
Chris Forsythe, USA	Kay Stanney, USA
Wai Tat Fu, USA	Roy Stripling, USA
Marc Grootjen, The Netherlands	Rob Taylor, UK
Jefferson Grubb, USA	Karl van Orden, USA
Santosh Mathan, USA	

Digital Human Modeling

Program Chair: Vincent G. Duffy

Karim Abdel-Malek, USA	Yaobin Chen, USA
Giuseppe Andreoni, Italy	Kathryn Cormican, Ireland
Thomas J. Armstrong, USA	Daniel A. DeLaurentis, USA
Norman I. Badler, USA	Yingzi Du, USA
Fethi Calisir, Turkey	Okan Ersoy, USA
Daniel Carruth, USA	Enda Fallon, Ireland
Keith Case, UK	Yan Fu, P.R. China
Julie Charland, Canada	Afzal Godil, USA

Ravindra Goonetilleke, Hong Kong
 Anand Gramopadhye, USA
 Lars Hanson, Sweden
 Pheng Ann Heng, Hong Kong
 Bo Hoege, Germany
 Hongwei Hsiao, USA
 Tianzi Jiang, P.R. China
 Nan Kong, USA
 Steven A. Landry, USA
 Kang Li, USA
 Zhizhong Li, P.R. China
 Tim Marler, USA

Ahmet F. Ozok, Turkey
 Srinivas Peeta, USA
 Sudhakar Rajulu, USA
 Matthias Rötting, Germany
 Matthew Reed, USA
 Johan Stahre, Sweden
 Mao-Jiun Wang, Taiwan
 Xuguang Wang, France
 Jingzhou (James) Yang, USA
 Gulcin Yucel, Turkey
 Tingshao Zhu, P.R. China

Human-Centered Design

Program Chair: Masaaki Kurosu

Julio Abascal, Spain
 Simone Barbosa, Brazil
 Tomas Berns, Sweden
 Nigel Bevan, UK
 Torkil Clemmensen, Denmark
 Susan M. Dray, USA
 Vanessa Evers, The Netherlands
 Xiaolan Fu, P.R. China
 Yasuhiro Horibe, Japan
 Jason Huang, P.R. China
 Minna Isomursu, Finland
 Timo Jokela, Finland
 Mitsuhiko Karashima, Japan
 Tadashi Kobayashi, Japan
 Seongil Lee, Korea
 Kee Yong Lim, Singapore

Zhengjie Liu, P.R. China
 Loïc Martínez-Normand, Spain
 Monique Noirhomme-Fraiture,
 Belgium
 Philippe Palanque, France
 Annelise Mark Pejtersen, Denmark
 Kerstin Röse, Germany
 Dominique L. Scapin, France
 Haruhiko Urokohara, Japan
 Gerrit C. van der Veer,
 The Netherlands
 Janet Wesson, South Africa
 Toshiki Yamaoka, Japan
 Kazuhiko Yamazaki, Japan
 Silvia Zimmermann, Switzerland

Design, User Experience, and Usability

Program Chair: Aaron Marcus

Ronald Baecker, Canada
 Barbara Ballard, USA
 Konrad Baumann, Austria
 Arne Berger, Germany
 Randolph Bias, USA
 Jamie Blustein, Canada

Ana Boa-Ventura, USA
 Lorenzo Cantoni, Switzerland
 Sameer Chavan, Korea
 Wei Ding, USA
 Maximilian Eibl, Germany
 Zelda Harrison, USA

XIV Organization

Rüdiger Heimgärtner, Germany

Brigitte Herrmann, Germany

Sabine Kabel-Eckes, USA

Kaleem Khan, Canada

Jonathan Kies, USA

Jon Kolko, USA

Helga Letowt-Vorbek, South Africa

James Lin, USA

Frazer McKimm, Ireland

Michael Renner, Switzerland

Christine Ronnewinkel, Germany

Elizabeth Rosenzweig, USA

Paul Sherman, USA

Ben Shneiderman, USA

Christian Sturm, Germany

Brian Sullivan, USA

Jaakko Villa, Finland

Michele Visciola, Italy

Susan Weinschenk, USA

HCI International 2013

The 15th International Conference on Human–Computer Interaction, HCI International 2013, will be held jointly with the affiliated conferences in the summer of 2013. It will cover a broad spectrum of themes related to human–computer interaction (HCI), including theoretical issues, methods, tools, processes and case studies in HCI design, as well as novel interaction techniques, interfaces and applications. The proceedings will be published by Springer. More information about the topics, as well as the venue and dates of the conference, will be announced through the HCI International Conference series website: <http://www.hci-international.org/>

General Chair
Professor Constantine Stephanidis
University of Crete and ICS-FORTH
Heraklion, Crete, Greece
Email: cs@ics.forth.gr

Table of Contents

Part I: Human Centered Design Methods and Tools

Investigating Users' Interaction with Physical Products Applying Qualitative and Quantitative Methods	3
<i>Chun-Juei Chou and Chris Conley</i>	
Human Interaction and Collaborative Innovation	13
<i>Kevin A. Clark</i>	
A Pattern Approach for Designing Application	22
<i>Kohei Daimaru and Buntaro Kaji</i>	
A Holistic Model for Integrating Usability Engineering and Software Engineering Enriched with Marketing Activities	28
<i>Holger Fischer, Karsten Nebe, and Florian Klompmaker</i>	
Investigation of Indirect Oral Operation Method for Think Aloud Usability Testing	38
<i>Masahiro Hori, Yasunori Kihara, and Takashi Kato</i>	
Exploring the Impact of Cultures on Web Usability Test	47
<i>Hsiu Ching Laura Hsieh</i>	
A Three-Fold Integration Framework to Incorporate User – Centered Design into Agile Software Development	55
<i>Shah Rukh Humayoun, Yael Dubinsky, and Tiziana Catarci</i>	
Development of Web-Based Participatory Trend Forecasting System: urtrend.net	65
<i>Eui-Chul Jung, SoonJong Lee, HeeYun Chung, BoSup Kim, HyangEun Lee, YoungHak Oh, YounWoo Cho, WoongBae Ra, HyeJin Kwon, and June-Young Lee</i>	
Consideration of HCD Methods for Service Innovation Design	74
<i>Akira Kondo and Naoko Kondo</i>	
Descriptive Words for Expressing the User Experience	81
<i>Masaaki Kurosu</i>	
Expert-Sided Workflow Data Acquisition by Means of an Interactive Interview System	91
<i>Daniel Ley</i>	
Human Systems Integration Design: Which Generalized Rationale?	101
<i>Romain Lieber and Didier Fass</i>	

The Impact of Human-Centred Design Workshops in Strategic Design Projects	110
<i>André Liem and Elizabeth B.-N. Sanders</i>	
Quantitative Evaluation of the Effectiveness of Idea Generation in the Wild	120
<i>Lassi A. Liikkanen, Matti M. Hämäläinen, Anders Häggman, Tua Björklund, and Mikko P. Koskinen</i>	
Usability Standards across the Development Lifecycle.....	130
<i>Mary Frances Theofanos and Brian C. Stanton</i>	
Structure of FUN Factors in the Interaction with Products	138
<i>Sayoko Tominaga, Toshihisa Doi, Toshiki Yamaoka, Yuka Misyashita, and Masayoshi Toriumi</i>	
Extraction of User Interaction Patterns for Low-Usability Web Pages ...	144
<i>Toshiya Yamada, Noboru Nakamichi, and Tomoko Matsui</i>	
A Proposal of Service Design Evaluation Method	153
<i>Toshiki Yamaoka</i>	
Idea Creation Method for HCD	160
<i>Kazuhiro Yamazaki</i>	
Vision-Proposal Design Method	166
<i>Koji Yanagida, Yoshihiro Ueda, Kentaro Go, Katsumi Takahashi, Seiji Hayakawa, and Kazuhiko Yamazaki</i>	
 Part II: Mobile and Ubiquitous Interaction	
Possibilities for Cultural Customization of Mobile Communication Devices: The Case of Iranian Mobile Users	177
<i>Bijan Aryana, Casper Boks, and Azadeh Navabi</i>	
<i>Smart Sol</i> – Bringing User Experience to Facility Management: Designing the User Interaction of a Solar Control Unit.....	187
<i>Patricia Böhm, Tim Schneidermeier, and Christian Wolff</i>	
Co-simulation and Multi-models for Pervasive Computing as a Complex System	197
<i>Laurent P. Ciarletta</i>	
Design and Development of Eyes- and Hands-Free Voice Interface for Mobile Phone	207
<i>Kengo Fujita and Tsuneo Kato</i>	
Influence of a Multimodal Assistance Supporting Anticipatory Driving on the Driving Behavior and Driver’s Acceptance	217
<i>Hermann Hajek, Daria Popiv, Mariana Just, and Klaus Bengler</i>	

Real User Experience of ICT Devices among Elderly People	227
<i>Ayako Hashizume, Toshimasa Yamanaka, and Masaaki Kurosu</i>	
Human Affordance as Life-Log for Environmental Simulations	235
<i>Masayuki Ihara, Minoru Kobayashi, and Takahiro Yoshioka</i>	
Guideline Development of Mobile Phone Design for Preventing Child Abuse	243
<i>JoonBin Im, Eui-Chul Jung, and JungYoon Yang</i>	
The Impact of Robots Language Form on People's Perception of Robots	253
<i>Yunhyung Kim, Sonya S. Kwak, and Myung-suk Kim</i>	
Adjustable Interactive Rings for iDTV: First Results of an Experiment with End-Users	262
<i>Leonardo Cunha de Miranda, Heiko Horst Hornung, and M. Cecília C. Baranauskas</i>	
 Part III: Human Centered Design in Health and Rehabilitation Applications	
Cognitive Prostheses: Findings from Attempts to Model Some Aspects of Cognition	275
<i>Norman Alm, Arlene Astell, Gary Gowans, Maggie Ellis, Richard Dye, Phillip Vaughan, and Philippa Riley</i>	
Management of Weight-Loss: Patients' and Healthcare Professionals' Requirements for an E-health System for Patients	285
<i>Anita Das, Arild Faxvaag, and Dag Svanæs</i>	
A Study on the Visibility of the Light Emitting Braille Block	295
<i>Hiromi Fukuda, Noriaki Kuwahara, Takao Suzuki, and Kazunari Morimoto</i>	
Knowledge Based Design of User Interface for Operating an Assistive Robot	304
<i>Rebekah Hazlett-Knudsen, Melissa A. Smith, and Aman Behal</i>	
Holistic Prosthetic Approaches to the Hearing Handicapped People: Communication Tools in Various Situations	313
<i>Kazuyuki Kanda and Tsutomu Kimura</i>	
Human-Centered Design in the Care of Immobile Patients	321
<i>Thomas Läubli, Roger Gassert, and Masaru Nakaseko</i>	
Electronic Medication Reminder for Older Adults	327
<i>Yi-Lin Lo, Chang-Franw Lee, and Wang-Chin Tsai</i>	

Development of a Wearable Airbag for Preventing Fall Related Injuries 335
Toshiyo Tamura, Takumi Yoshimura, Masaki Sekine, and Mitsuo Uchida

Semantic-Conditioned Peripheral Vision Acuity Fading Awareness (PVAFA) 340
Ming-Chia Wang and Manlai You

Part IV: Human Centered Design in Work, Business and Education

Culturally Situated Design Tools: Animated Support Tools for Mathematics 351
Albanie T. Bolton and Cheryl D. Seals

Towards a Paperless Air Traffic Control Tower 360
Tanja Bos, Marian Schuwer – van Blanken, and Hans Huisman

A Design-Supporting Tool for Implementing the Learning-Based Approach: Accommodating Users’ Domain Knowledge into Design Processes 369
Jung-Min Choi and Keiichi Sato

A Methodical Approach for Developing Valid Human Performance Models of Flight Deck Operations 379
Brian F. Gore, Becky L. Hooley, Nancy Haan, Deborah L. Bakowski, and Eric Mahlstedt

Building Human Profile by Aggregation of Activities: Application to Aeronautics Safety 389
Laurent Chaudron, David Guéron, Nicolas Maille, and Jean Caussanel

Building a Shared Cross-Cultural Learning Community for Visual Communication Design Education 397
Takahito Kamihira, Miho Aoki, and Tomoya Nakano

Expansion of the System of JSL-Japanese Electronic Dictionary: An Evaluation for the Compound Research System- 407
Tsutomu Kimura, Daisuke Hara, Kazuyuki Kanda, and Kazunari Morimoto

Co-creation Process of Collaborative Work with Communication Robot 417
Seita Koike, Takeshi Ogino, Sari Takamura, Tatsushi Miyaji, Yuki Miyajima, Daishi Kato, Koyo Uemura, Kazuo Kunieda, and Keiji Yamada

Virtual Office, Community, and Computing (VOCC): Designing an Energy Science Hub Collaboration System	425
<i>April A. Lewis and Gilbert G. Weigand</i>	
One of Industrial Design Case to Share Tacit Knowledge	435
<i>Hisashi Shima</i>	
Task Analysis for Behavioral Factors Evaluation in Work System Design	440
<i>Lingyan Wang and Henry Y.K. Lau</i>	
Understanding the Business Realities: An Interview Technique Which Can Visualize the Job Problems	449
<i>Ayako Yajima, Yuji Shiino, and Toshiki Yamaoka</i>	
Part V: Applications of Human Centered Design	
Nonspeech Sound Design for a Hierarchical Information System	461
<i>Rafa Absar and Catherine Guastavino</i>	
Social Networking Applications: Smarter Product Design for Complex Human Behaviour Modeling	471
<i>Tareq Ahram and Waldemar Karwowski</i>	
Usability Tests for Improvement of 3D Navigation in Multiscale Environments	481
<i>Tathiane Mendonça Andrade, Daniel Ribeiro Trindade, Eduardo Ribeiro Silva, Alberto Barbosa Raposo, and Simone Diniz Junqueira Barbosa</i>	
SemaZoom: Semantics Exploration by Using a Layer-Based Focus and Context Metaphor	491
<i>Dirk Burkhardt, Kawa Nazemi, Matthias Breyer, Christian Stab, and Arjan Kuijper</i>	
Scientometric Analysis of Research in Smart Clothing: State of the Art and Future Direction	500
<i>Kyeyoun Choi, Huiju Park, Eui-Seob Jeong, and Semra Peksoz</i>	
An Experimental Study of Home Page Design on Green Electronic Products Web Site	509
<i>Fei-Hui Huang</i>	
Attribute Description Service for Large-Scale Networks	519
<i>Donald Kline and John Quan</i>	
Study of Honest Signal: Bringing Unconscious Channel of Communication into Awareness through Interactive Prototype	529
<i>YounJung Kwak, Tiia Suomalainen, and Jussi Mikkonen</i>	

Designing of an Effective Monitor Partitioning System with Adjustable Virtual Bezel	537
<i>Sangsu Lee, Hyunjeong Kim, Yong-ki Lee, Minseok Sim, and Kun-pyo Lee</i>	
Bridging the Social Media Usage Gap from Old to New: An Elderly Media Interpersonal and Social Research in Taiwan	547
<i>Shih-Hsun Lin and Wen Huei Chou</i>	
Research in the Use of Product Semantics to Communicate Product Design Information	556
<i>Chung-Hung Lin</i>	
Adapting User Interfaces by Analyzing Data Characteristics for Determining Adequate Visualizations	566
<i>Kawa Nazemi, Dirk Burkhardt, Alexander Praetorius, Matthias Breyer, and Arjan Kuijper</i>	
User-Oriented Graph Visualization Taxonomy: A Data-Oriented Examination of Visual Features	576
<i>Kawa Nazemi, Matthias Breyer, and Arjan Kuijper</i>	
Towards Compositional Design and Evaluation of Preference Elicitation Interfaces	586
<i>Alina Pommeranz, Pascal Wiggers, and Catholijn M. Jonker</i>	
Secure Online Game Play with Token: A Case Study in the Design of Multi-factor Authentication Device	597
<i>Shinji R. Yamane</i>	
Author Index	607