

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 of Computer Science, Saarbruecken, Germany

Klaus Miesenberger Joachim Klaus
Wolfgang Zagler Arthur Karshmer (Eds.)

Computers Helping People with Special Needs

12th International Conference, ICCHP 2010
Vienna, Austria, July 14-16, 2010
Proceedings, Part I

Volume Editors

Klaus Miesenberger
University of Linz, Institute "Integriert Studieren"
Altenbergerstraße 49, 4040, Linz, Austria
E-mail: klaus.miesenberger@jku.at

Joachim Klaus
University of Karlsruhe (TH), Study Center for the Visually Impaired Students
Engesserstr. 4, 76131 Karlsruhe, Germany
E-mail: klaus@szs.uni-karlsruhe.de

Wolfgang Zagler
Vienna University of Technology, Institute "Integriert Studieren"
Favoritenstr. 11/029, 1040, Vienna, Austria
E-mail: zw@fortec.tuwien.ac.at

Arthur Karshmer
University of San Francisco
2130 Fulton St., San Francisco, CA 94117, USA
E-mail: arthur@lakeland.usf.edu

Library of Congress Control Number: 2010929485

CR Subject Classification (1998): H.5.2, H.5, H.4, H.3, K.4, K.4.2

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

ISSN 0302-9743
ISBN-10 3-642-14096-3 Springer Berlin Heidelberg New York
ISBN-13 978-3-642-14096-9 Springer Berlin Heidelberg New York

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.

springer.com

© Springer-Verlag Berlin Heidelberg 2010
Printed in Germany

Typesetting: Camera-ready by author, data conversion by Scientific Publishing Services, Chennai, India
Printed on acid-free paper 06/3180

Preface

Welcome to the Proceedings of ICCHP 2010!



We were proud to welcome participants from more than 40 countries from all over the world to this year's ICCHP.

Since the late 1980s, it has been ICCHP's mission to support and reflect development in the field of "Assistive Technologies," eAccessibility and eInclusion. With a focus on scientific quality, ICCHP has become an important reference in our field. The 2010

conference and this collection of papers once again fulfilled this mission.

The International Programme Committee, comprising 106 experts from all over the world, selected 147 full and 44 short papers out of 328 abstracts submitted to ICCHP. This acceptance ratio of about half of the submissions demonstrates our strict pursuit of scientific quality both of the programme and in particular of the proceedings in your hands.

An impressive number of experts agreed to organize "Special Thematic Sessions" (STS) for ICCHP 2010. These STS help to bring the meeting into sharper focus in several key areas. In turn, this deeper level of focus helps to collate a state of the art and mainstream technical, social, cultural and political developments.

Our keynote speakers highlighted issues of outstanding importance, such as "*Usable Web Accessibility*," areas which can be seen as breakthroughs in our field, like the development of 2D Braille displays *allowing "Maintaining an Overview Through Your Fingers,"* and new and upcoming issues of interest for our field, like "*Weak and Silent Speech*." Additional keynote addresses included presentations from the *European Commission, UNESCO and ISO*.

With an interesting workshop programme, meetings, an exhibition including presentations and demonstrations of major software and assistive technology producers and vendors, ICCHP once again provided the framework for an international meeting place and a center of advanced information exchange.

ICCHP 2010 was held under the auspices of Heinz Fischer, President of the Federal Republic of Austria. We would also like to thank all supporters and sponsors.

Our special thanks go to those contributing toward putting this conference in place.

We thank the Austrian Computer Society for announcing and sponsoring the Roland Wagner Award on Computers Helping People with Special Needs.

The Austrian Computer Society decided in September 2001 to endow this award in honor of Roland Wagner, the founder of ICCHP.

The Roland Wagner Award is a biannual award in the range of €3000. It will be handed over on the occasion of ICCHP conferences.

Award Winners:

- Award 0: Roland Wagner on the occasion of his 50th birthday, 2001
- Award 1: WAI-W3C, ICCHP 2002 in Linz
- Special Award 2003: A Min Tjoa, Vienna University of Technology on the occasion of his 50th birthday
- Award 2: Paul Blenkhorn, University of Manchester, ICCHP 2004 in Paris
- Award 3: Larry Scadden, National Science Foundation, ICCHP 2006 in Linz
- Special Award 2006: Roland Traunmüller, University of Linz
- Award 4: George Kersher, Daisy Consortium

Once again we thank all those who helped in putting ICCHP in place and thereby supporting the AT field and a better quality of life for people with disabilities. Special thanks go to all our supporter and sponsors, displayed at:
<http://www.icchp.org/sponsors>.

July 2010

Klaus Miesenberger
Joachim Klaus
Arthur Karshmer
Wolfgang Zagler

Organization

General ICCHP 2010 Chair, H.J. Murphy, Founder, Former Director and Member Advisory Board of the Centre on Disabilities, California State University, Northridge, USA.

Programme Chairs

Karshmer, A.	University of San Francisco, USA
Burger, D.	INSERM, France
Suzuki, M.	Kyushu University, Japan
Tjoa, A. M.	Vienna University of Technology, Austria
Wagner, R.	University of Linz, Austria

Publishing Chairs

Klaus, J.	Karlsruhe Institute of Technology (KIT), Germany
Miesenberger, K.	University of Linz, Austria
Zagler, W.	Vienna University of Technology, Austria

Young Researchers Consortium Chairs

Alm, N.	Dundee University, UK
Archambault, D.	Université Pierre et Marie Curie, France
Fels, D.	Ryerson University, Canada
Fitzpatrick, D.	Dublin City University, Ireland
Kobayashi, M.	Tsukuba College of Technology, Japan
Morandell, M.	AIT Austrian Institute of Technology GmbH, Austria
Pontelli, E.	New Mexico State University, USA
Sinclair, R.	Microsoft, USA
Weber, G.	Technische Universität Dresden, Germany

Programme Committee

Abascal, J.	Euskal Herriko Unibertsitatea, Spain
Abou-Zahra, S.	W3C Web Accessibility Initiative (WAI), Austria
Abu-Ali, A.	Philadelphia University, Jordan
Andrich, R.	Polo Tecnologico Fondazione Don Carlo Gnocchi Onlus, Italy
Arató, A.	KFKI-RMKI, Hungary
Arató, P.	TU Budapest, Hungary
Ariwa, E.	London Metropolitan University, UK
Azevedo, L.	Instituto Superior Tecnico, Portugal

Batusic, M.	University of Linz, Austria
Baumann, K.	FH Johaneum, Austria
Bernareggi, C.	Università degli Studi di Milano, Italy
Bothe, H.-H.	Technical University of Denmark, Denmark
Bühler, C.	TU Dortmund University, FTB, Germany
Craddock, G.	Centre for Excellence in Universal Design, Ireland
Craven, J.	CERLIM, Manchester Metropolitan University, UK
Crombie, D.	European Adaptive Content Network (EUAIN), The Netherlands
Cummins Prager, M.	California State University Northridge, USA
Darvishy, A.	Züricher Hochschule für Angewandte Wissenschaften, Switzerland
Darzentas, J.	University of the Aegean, Greece
DeRuyter, F.	Duke University Medical Center, USA
Diaz del Campo, R.	Antarq Tecnosoluciones, Mexico
Dotter, F.	Universität Klagenfurt, Austria
Edwards, A.D.N.	University of York, UK
Emiliani, P.L.	Institute of Applied Physics "Nello Carrara", Italy
Engelen, J.	Katholieke Universiteit Leuven, Belgium
Evreinov, G.	University of Tampere, Finland
Gardner, J.	Oregon State University, USA
Gupta, G.	University of Texas at Dallas, USA
Hanson, V.	University of Dundee, UK
Harper, S.	University of Manchester, UK
Holzinger, A.	Graz University Hospital, Austria
Inoue, T.	National Rehabilitation Center for Persons with Disabilities, Japan
Ioannidis, G	IN2 search interfaces development Ltd, Germany
Jemni, M.	University of Tunis, Tunisia
Kalinnikova, L.	Pomor State University, Russia
Knops, H.	NG4All, The Netherlands
Koronios, A.	University of South Australia, Australia
Kouroupetroglou, G.	University of Athens, Greece
Kremser, W.	OCG, HSM, Austria
Lauruska, V.	Siauliai University, Lithuania
Leahy, D.	Trinity College Dublin, Ireland
Lunn, D.	University of Manchester, UK
Magnussen, M.	Stockholm University, Sweden
Mathiassen, N-E.	Danish Centre for Assistive Technology, Denmark
McKenzie, N.	DEDICON, The Netherlands
McMullin, B.	Dublin City University, Ireland
Mendelova, E.	Comenius University of Bratislava, Slovak Republic
Neveryd, H.	Lund University, Sweden
Normie, L.	GeronTech - The Israeli Center for Assistive Technology & Aging, Israel
Nussbaum, G.	KI-I, Austria
Ohnabe, H.	Niigata University of Health & Welfare, Japan

Ono, T.	Tsukuba University of Technology, Japan
Otogawa, T.	National Rehabilitation Center for Persons with Disabilities, Japan
Paciello, M.	The Paciello Group, USA
Panek, P.	Vienna University of Technology, Austria
Petrie, H.	University of York, UK
Petz, A.	University of Linz, Austria
Prazak, B.	Austrian Research Centres, Austria
Pühretmair, F.	KI-I, Austria
Quirchmayr, G.	University of Vienna, Austria
Raisamo, R.	University of Tampere, Finland
Rauhala, M.	Vienna University of Technology, Austria
Salminen, A.	KELA, Finland
Scadden, L.	Independent Consultant on Assistive Technology, USA
Schultz, T.	Universität Karlsruhe (TH), Germany
Sik Lányi, C.	University of Pannonia, Hungary
Snarud, M.	University of Agder, Norway
Soede, T.	Zuyd University, The Netherlands
Steiner, D.	University of Linz, Austria
Stephanidis, C.	University of Crete, FORTH-ICS, Greece
Stoeger, B.	University of Linz, Austria
Strauss, C.	University of Vienna, Austria
Sueda, O.	University of Tokushima, Japan
Svensson, H.	National Agency for Special Needs Education and Schools, Sweden
Takahashi, Y.	Toyo University, Japan
Tauber, M.	University of Paderborn, Germany
Traunmüller, R.	University of Linz, Austria
Trehin, P.	World Autism Organisation, Belgium
Treviranus, J.	University of Toronto, Canada
Vaspöri, T.	KFKI-RMKI, Hungary
Velasco, C.A.	Fraunhofer Institute for Applied Information Technology, Germany
Vigouroux, N.	IRIT Toulouse, France
Wagner, Gerold	Upper Austria University of Applied Sciences, Austria
Weber, H.	ITA, University of Kaiserslautern, Germany
Wöß, W.	University of Linz, Austria

Organizing Committee (University of Linz, Vienna Technical University)

Bernkopf, G.	Ossmann, R.	Keim, C.
Feichtenschlager, P.	Petz, A.	Neustätter, G.
Miesenberger, K.	Schult, C.	Vomastek, C.
Morandell, M.	Fuhrmann – Ehn, M.	Zagler, W.

Table of Contents – Part I

Design for Adaptive Content Processing

Design for Adaptive Content Processing: Introduction to the Special Thematic Session	1
<i>David Crombie</i>	
Generating DAISY Books from OpenOffice.org	5
<i>Christophe Strobbe, Jan Engelen, and Vincent Spiewak</i>	
Combining Web Services and DAISY for the Production and Delivery of Audio Tactile Diagrams	12
<i>Declan McMullen and Donal Fitzpatrick</i>	
Wiki, a New Way to Produce Accessible Documents	20
<i>Alex Bernier, Dominique Burger, and Bruno Marmol</i>	
Guided Generation and Evaluation of Accessible Scalable Vector Graphics	27
<i>Bernhard Dürnegger, Christina Feilmayr, and Wolfram Wöß</i>	
Improving the Re-digitisation Process by Using Software with Automatic Metadata Detection	35
<i>Reinhard Ruemer, Klaus Miesenberger, Franz Kummer, and Claus Gravenhorst</i>	
New Production and Delivery System for Pupils with Disabilities in Austria as Chance for Higher Quality Output	43
<i>Reinhard Ruemer and Klaus Miesenberger</i>	
A Flexible Software Architecture Concept for the Creation of Accessible PDF Documents	47
<i>Alireza Darvishy, Hans-Peter Hutter, Alexander Horvath, and Martin Dorigo</i>	

Digital Access to Documents for People with Print Disabilities

DAISY Kindergarten Books and Rocket Science Journals	53
<i>John A. Gardner, Carolyn K. Gardner, Vladimir Bulatov, Blake Jones, Elizabeth Jones, Robert A. Kelly, Masakazu Suzuki, and Katsuhito Yamaguchi</i>	

Exploiting the Daisy Format for Automated, Single-Source Braille Publishing	57
<i>Lars Ballieu Christensen</i>	
Rapid Listening of DAISY Digital Talking Books by Speech-Rate Conversion Technology for People with Visual Impairments.....	62
<i>Naoyuki Tazawa, Shinichi Totihara, Yukio Iwahana, Atsushi Imai, Nobumasa Seiyama, and Toru Takagi</i>	
E-Books and Audiobooks: What about Their Accessibility?.....	69
<i>Jan Engelen</i>	
E-Books and Inclusion: Dream Come True or Nightmare Unending?	74
<i>Alistair McNaught, Shirley Evans, and Simon Ball</i>	
Collaboratively Generated Content on the Audio-Tactile Map	78
<i>Armin B. Wagner</i>	
Generating Braille from OpenOffice.org	81
<i>Bert Frees, Christophe Strobbe, and Jan Engelen</i>	
Sonification of ASCII Circuit Diagrams	89
<i>Angela Constantinescu and Karin Müller</i>	
Accessing Google Docs via Screen Reader	92
<i>Maria Claudia Buzzi, Marina Buzzi, Barbara Leporini, Giulio Mori, and Victor M.R. Penichet</i>	
Making Digital Maps Accessible Using Vibrations	100
<i>Bernhard Schmitz and Thomas Ertl</i>	
Non-visual Navigation of Spreadsheet Tables	108
<i>Iyad Abu Doush and Enrico Pontelli</i>	
New Testing Method for the Dyslexic and the Newly Blind with a Digital Audio Player and Document Structure Diagrams	116
<i>Mamoru Fujiyoshi, Akio Fujiyoshi, and Toshiaki Aomatsu</i>	
Annotating and Describing Pictures – Applications in E-Learning and Accessibility of Graphics	124
<i>Ivan Kopeček and Radek Ošlejšek</i>	
New Concepts of PC Interaction for Blind Users Based on Braille Displays with ATC Technology (Active Tactile Control).....	131
<i>Siegfried Kipke</i>	

HCI and Non Classical Interfaces

Inclusive E-Services for All: Identifying Accessibility Requirements for Upcoming Interaction Technologies	135
<i>Alejandro Rodriguez-Ascaso, Erik Zetterström, Martin Böcker, Helge Hüttenrauch, Michael Pluke, and Matthias Schneider</i>	
HAIL: Hierarchical Adaptive Interface Layout	139
<i>John Magee and Margrit Betke</i>	
Customizable Software Interface for Monitoring Applications	147
<i>Manuel Merino, Isabel Gómez, Octavio Rivera, and Alberto J. Molina</i>	
Towards to Real-Time System with Optimization Based Approach for EOG and Blinking Signals Separation for Human Computer Interaction	154
<i>Robert Krupiński and Przemysław Mazurek</i>	
Towards Accessible Interactions with Pervasive Interfaces, Based on Human Capabilities	162
<i>Matthew Tylee Atkinson, Yunqiu Li, Colin H.C. Machin, and David Sloan</i>	
Accelerometer and Spatial Audio Technology: Making Touch-Screen Mobile Devices Accessible	170
<i>Flaithri Neff, Tracey J. Mehigan, and Ian Pitt</i>	

HCI: Software Accessibility and Social Interaction

An Open Source / Freeware Assistive Technology Software Inventory ...	178
<i>Alexandros Pino, Georgios Kouroupetroglou, Hernisa Kacorri, Anna Sarantidou, and Dimitris Spiliotopoulos</i>	
Designing and Developing Accessible Java Swing Applications	186
<i>Theofanis Oikonomou, Konstantinos Votis, Dimitrios Tzovaras, and Peter Korn</i>	
Effects of Visual Stimuli on a Communication Assistive Method Using Sympathetic Skin Response	189
<i>Fumihiko Masuda and Chikamune Wada</i>	
Computerized Assessing the Mouse Proficiency through Multiple Indicators	193
<i>Ming-Chung Chen, Yun-Lung Lin, and Chien-Chuan Ko</i>	
PUIR: Parallel User Interface Rendering	200
<i>Kris Van Hees and Jan Engelen</i>	

Transient Cooperation in Social Applications for Accessibility Mapping	208
<i>Harald Holone and Jo Herstad</i>	
A Social Approach to Accessible Social Networking Using the CAT Model	216
<i>Jennifer George, Gilbert Cockton, and Thomas Greenough</i>	

Entertainment Software Accessibility

Entertainment Software Accessibility: Introduction to the Special Thematic Session	224
<i>Dominique Archambault</i>	
User Interface Evaluation of Serious Games for Students with Intellectual Disability	227
<i>Cecilia Sik Lanyi, David J. Brown, Penny Standen, Jacqueline Lewis, and Vilma Butkute</i>	
Making Mainstreaming Videogames More Accessible: A Pilot Study Applied to Buzz!™ Junior Monster Rumble for PlayStation	235
<i>Elena Laudanna, Maria Bulgheroni, Francesca Caprino, and Serenella Besio</i>	
Accessibility of a Social Network Game	243
<i>Roland Ossmann and Klaus Miesenberger</i>	
Using Placement and Name for Speaker Identification in Captioning	247
<i>Quoc V. Vy and Deborah I. Fels</i>	
A Real-Time Network Board Game System Using Tactile and Auditory Senses for the Visually Impaired	255
<i>Daisuke Nagasaka, Naoki Kaneda, Kazunori Itoh, Makoto Otani, Michio Shimizu, Masahiko Sugimoto, Masami Hashimoto, and Mizue Kayama</i>	

Accessible Tourism

Realizing Accessible Tourism by Matching Stakeholders: Introduction to the Special Thematic Session	263
<i>Kerstin Matausch and Franz Pühretmair</i>	
Planning of Inclusive and Accessible Events	266
<i>Kerstin Matausch and Klaus Miesenberger</i>	
User Feed-Back in the Development of an Information System for Public Transport	273
<i>Christian Bühler, Helmut Heck, Christian Radek, Rainer Wallbruch, Josef Becker, and Claudia Bohner-Degrell</i>	

User-Specific Web-Based Route Planning	280
<i>Bettina Pressl, Christoph Mader, and Manfred Wieser</i>	

Smart and Assistive Environments

Results of a Workshop Series on Ambient Assisted Living	288
<i>Martin M. Morandell and Erwin Fugger</i>	

Challenges for Norwegian PC-Users with Parkinson's Disease – A Survey	292
<i>Miriam Eileen Nes Begnum</i>	

Usability and Usefulness of GPS Based Localization Technology Used in Dementia Care	300
<i>Øystein Dale</i>	

Development of Universal Communication Aid for Emergency Using Motion Pictogram.....	308
<i>Mari Kakuta, Kaoru Nakazono, Yuji Nagashima, and Naotsune Hosono</i>	

Friendly Human-Machine Interaction in an Adapted Robotized Kitchen.....	312
<i>Joan Aranda, Manuel Vinagre, Enric X. Martín, Miquel Casamitjana, and Alicia Casals</i>	

Audio Classification Techniques in Home Environments for Elderly/Dependant People	320
<i>Héctor Lozano, Inmaculada Hernández, Artzai Picón, Javier Camarena, and Eva Navas</i>	

Autonomamente: Using Goal Attainment Scales to Evaluate the Impact of a Multimodal Domotic System to Support Autonomous Life of People with Cognitive Impairment	324
<i>Thimoty Barbieri, Piero Fraternali, Antonio Bianchi, and Clarissa Tacchella</i>	

PMD: Designing a Portable Medicine Dispenser for Persons Suffering from Alzheimer's Disease.....	332
<i>Roel de Beer, Roy Keijers, Suleman Shahid, Abdullah Al Mahmud, and Omar Mubin</i>	

Usable Web Accessibility: Editing

Merging Web Accessibility and Usability by Patterns	336
<i>Helmut Vieritz, Daniel Schilberg, and Sabina Jeschke</i>	

Towards the Convergence of Web 2.0 and Semantic Web for E-Inclusion	343
<i>Laura Burzagli, Andrea Como, and Francesco Gabbanini</i>	
Beyond a Visuocentric Way of a Visual Web Search Clustering Engine: The Sonification of WhatsOnWeb	351
<i>Maria Laura Mele, Stefano Federici, Simone Borsci, and Giuseppe Liotta</i>	
Editing Web Presentations by Means of Dialogue	358
<i>Luděk Bártek</i>	
Fast Access to Web Pages with Finger Reading	366
<i>Toshihiro Kanahori</i>	
The Evaluations of Deletion-Based Method and Mixing-Based Method for Audio CAPTCHAs	368
<i>Takuya Nishimoto and Takayuki Watanabe</i>	
Integrating Semantic Web and Folksonomies to Improve E-Learning Accessibility	376
<i>Iyad Abu Doush and Enrico Pontelli</i>	
Simple Browser Construction Toolkit	384
<i>Osamu Miyamoto</i>	

Usable Web Accessibility: Education and Motivation

Organizational Motivations for Web Accessibility Implementation – A Case Study	392
<i>Marie-Luise Leitner and Christine Strauss</i>	
Using Collaborative Learning to Teach WCAG 2.0	400
<i>Fernando Alonso, José L. Fuertes, Ángel L. González, and Loïc Martínez</i>	
Web_Access: Education on Accessible Web Design	404
<i>Klaus Miesenberger, Barbara Hengstberger, and Mario Batusic</i>	

Usable Web Accessibility: Evaluation

Assessing WCAG 2.0 Conformance in Practice	408
<i>Sylvie Duchateau, Denis Boulay, and Dominique Burger</i>	
Is the Accessibility Audit Dead?	413
<i>Joshue O Connor</i>	

Evaluating Conformance to WCAG 2.0: Open Challenges	417
<i>Fernando Alonso, José L. Fuertes, Ángel L. González, and Loïc Martínez</i>	
Automatic Checking of Alternative Texts on Web Pages	425
<i>Morten Goodwin Olsen, Mikael Snaprud, and Annika Nietzio</i>	
OASES: Online Accessibility Self Evaluation Service - A Web-Based Tool for Education Institutions to Self-Assess the Accessibility of Their Practice	433
<i>Simon Ball, Alistair McNaught, Sue Watson, and Andrew Chandler</i>	
Analysis and Evaluation of the Accessibility to Visual Information in Web Pages	437
<i>Youssef Bou Issa, Mustapha Mojahid, Bernard Oriola, and Nadine Vigouroux</i>	
User Testing of Google Reader and RIA Complexity — A Warning	444
<i>Joshue O Connor</i>	
Analyzing Effect of Web Accessibility — A Framework to Determine Changes in Website Traffic and Success	449
<i>Rudolf Hartjes and Christine Strauss</i>	

eGovernment Accessibility

Implementation Concept for an Accessible Web CMS	456
<i>Dietmar Nedbal and Gerald Petz</i>	
Requirements of the Vision Impairments for E-Government Services in Taiwan from Accessibility to Efficiency	464
<i>Chi Nung Chu</i>	
Accessibility of eGovernment Web Sites: Towards a Collaborative Retrofitting Approach	468
<i>Annika Nietzio, Morten Goodwin Olsen, Mandana Eibegger, and Mikael Snaprud</i>	
Improving the Accessibility of Fabasoft Folio by Means of WAI-ARIA	476
<i>Mario Batusic and Daniela Steiner</i>	

Accessibility of Blended and E-Learning for Mature Age and Disabled Students and Staff

Accessibility of Blended and E-Learning for Mature Age and Disabled Students and Staff: Introduction to the Special Thematic Session	484
<i>Helen Petrie, Christopher Power, Carlos A. Velasco, and Jesus G. Boticario</i>	

Understanding and Supporting the Needs of Educational Professionals Working with Students with Disabilities and Mature Age Students	486
<i>David Swallow, Helen Petrie, and Christopher Power</i>	
Institutional Conditions for the Implementation of Accessible Lifelong Learning (ALL) Based on the EU4ALL Approach	492
<i>Cäcilia Weiermair-Märki and Elisabeth Unterfrauner</i>	
Design Guidelines for Developing Curriculum-Focused ICT Materials for Diverse Students	495
<i>Cara Nicole Greene</i>	
A Framework to Support Development of Learning Applications for Disabled Children	503
<i>José L. Fuertes, Ángel L. González, Gonzalo Mariscal, and Carlos Ruiz</i>	
Using Robots in Education and Therapy Sessions for Children with Disabilities: Guidelines for Teachers and Rehabilitation Professionals . . .	511
<i>Francesca Caprino, Serenella Besio, and Elena Laudanna</i>	
Virtual Learning Environments: Another Barrier to Blended and E-Learning	519
<i>Christopher Power, Helen Petrie, Vasily Sakharov, and David Swallow</i>	

Successful Service Provision

ICT for Persons with Disabilities: Bridging the Digital Divide in Bangladesh	527
<i>Mahjabeen Khaled Hossain</i>	
Success through Exchange: The Higher Education Accessibility Guide (HEAG)	531
<i>Andrea Petz and Klaus Miesenberger</i>	
Linking Instruments and Documenting Decisions in Service Delivery Guided by an ICF-Based Tool for Assistive Technology Selection	537
<i>Emily Steel, Gert Jan Gelderblom, and Luc de Witte</i>	
Easy-to-Use Social Network Service	544
<i>Niina Sillanpää, Sami Älli, and Timo Övermark</i>	

Standards: A Driver for Accessibility and Usability

Standards Are Drivers for Accessibility and Usability: Introduction to the Special Thematic Session	550
<i>Jan Engelen and Christian Bühler</i>	

International AT and DfA Standardisation: What Is in the Pipeline? ... <i>Jan Engelen</i>	553
Redefining Assumptions: Accessibility and Its Stakeholders <i>Rui Lopes, Karel Van Isacker, and Luís Carriço</i>	561
Stand4All: Promoting More Accessible Standards through Training of Stakeholders <i>Christophe Strobbe, Charlotte Mosies, Christian Bühler, and Jan Engelen</i>	569
Standards-Based Content Resources: A Prerequisite for Content Integration and Content Interoperability <i>Christian Galinski and Karel Van Isacker</i>	573
Standardization and Sustainability of Open Source Products - Barriers and Conflicts Demonstrated with the Linux Screenreader SUE - <i>Andrea Gaal, Gerhard Jaworek, and Joachim Klaus</i>	580
The Challenge of Mainstreaming ICT Design for All <i>Gill Whitney, Suzette Keith, and Barbara Schmidt-Belz</i>	583
Evaluating the Users' Satisfaction Using Inclusive Initiatives in Two Different Environments: The University and a Research Conference <i>Ana Iglesias, Lourdes Moreno, Javier Jiménez, and Pablo Revuelta</i>	591
 People with Speech Impairment: “Weak and Silent Speech”: Tools to Support People with Speech Impairment	
ICCHP Keynote: Recognizing Silent and Weak Speech Based on Electromyography <i>Tanja Schultz</i>	595
CanSpeak: A Customizable Speech Interface for People with Dysarthric Speech <i>Foad Hamidi, Melanie Baljko, Nigel Livingston, and Leo Spalteholz</i>	605
Adding Voice to Whisper Using a Simple Heuristic Algorithm Inferred from Empirical Observation <i>Rüdiger Heimgärtner</i>	613
LIPPS — A Virtual Teacher for Speechreading Based on a Dialog-Controlled Talking-Head <i>Hermann Gebert and Hans-Heinrich Bothe</i>	621

People with Speech Learning and Cognitive Problems: Easy-to-Web

Easy-to-Web:

Introduction to the Special Thematic Session	630
<i>Cordula Edler and Birgit Peböck</i>	
The Need for Easy-to-Read Information on Web Sites	634
<i>Ulla Bohman</i>	
EasyWeb – A Study How People with Specific Learning Difficulties Can Be Supported on Using the Internet	641
<i>Kerstin Matausch and Birgit Peböck</i>	
Supporting the Web Experience of Young People with Learning Disabilities	649
<i>Harald Weber and Cordula Edler</i>	
Easy-to-Web Search for People with Learning Disabilities as Part of an Integrated Concept of Cognitive Web Accessibility	657
<i>Stephan Bergmann and Markus Erle</i>	
Adaptive Reading: A Design of Reading Browser with Dynamic Alternative Text Multimedia Dictionaries for the Text Reading Difficulty Readers	661
<i>Chi Nung Chu and Yao-Ming Yeh</i>	
In-Folio: An Open Source Portfolio for Students with Learning Disabilities	665
<i>Simon Ball, Andrew Chandler, Emma Millard, and John Sewell</i>	
Author Index	669

Table of Contents – Part II

People with Specific Learning and Cognitive Problems: ICT, AT and HCI

Methodological Considerations for Involving SpLD Practitioners and Specialists in Designing Interactive Learning Systems	1
<i>Latifa Al-Abdulkarim, Areej Al-Wabil, Maha Al-Yahya, Abeer Al-Humaimedy, and Sara Al-Khudair</i>	
Involving Users in the Design of ICT Aimed to Improve Education, Work, and Leisure for Users with Intellectual Disabilities	5
<i>Emanuela Mazzone, Emmanuelle Gutiérrez y Restrepo, Carmen Barrera, Cecile Finat, Olga C. Santos, Jesús Boticario, Javier Moranchel, Jose Ramón Roldán, and Roberto Casas</i>	
PDA Software Aimed at Improving Workplace Adaptation for People with Cognitive Disabilities	13
<i>Alberto Ferreras, Juan-Manuel Belda, Ricard Barberà, Rakel Poveda, Miguel Urra, Nuria García, Miguel Tito, and Marta Valero</i>	
EasyICT: A Framework for Measuring ICT-Skills of People with Cognitive Disabilities	21
<i>Jan Dekelver, Tim Vannuffelen, and Joan De Boeck</i>	
Towards an Interactive Screening Program for Developmental Dyslexia: Eye Movement Analysis in Reading Arabic Texts	25
<i>Areej Al-Wabil and Maha Al-Sheaha</i>	
Developing a Multimedia Environment to Aid in Vocalization for People on the Autism Spectrum: A User-Centered Design Approach	33
<i>Areej Al-Wabil, Hadeel Al-Shabanat, Rawan Al-Sarrani, and Manal Al-Khonin</i>	
The Performance of Mouse Proficiency for Adolescents with Intellectual Disabilities	37
<i>Ting-Fang Wu, Ming-Chung Chen, and Chi-Fen Wu</i>	
When Words Fall Short: Helping People with Aphasia to Express	45
<i>Tom Koppenol, Abdullah Al Mahmud, and Jean-Bernard Martens</i>	

People with Motor Disabilities: HCI and Rehabilitation

MarkerMouse: Mouse Cursor Control Using a Head-Mounted Marker . . . <i>Rados Javanovic and Ian Scott MacKenzie</i>	49
Using Triaxial Acceleration Sensors as Input Devices for Disabled Persons <i>Matthias Söllner, Philipp Hofmann, and Josef Pösl</i>	57
Canceling Interference Caused by Tremors in Joystick Controller: Study Case in a Power Wheelchair <i>Ludmila Correa de Alkmin Silva, Fernanda Cristina Corrêa, Geraldo Gonçalves Delgado Neto, Vivianne V. Delgado, and Franco Giuseppe Dedini</i>	61
Developing Rehabilitation Robots for the Brain Injured <i>Paul Gnanayutham and Jennifer George</i>	69
A Rehabilitation Method with Visual and Haptic Guidance for Children with Upper Extremity Disability <i>Kup-Sze Choi, Chum-Ming Chow, and King-Hung Lo</i>	77
SSVEP Based Brain-Computer Interface for Robot Control <i>Rupert Ortner, Christoph Guger, Robert Prüeckl, Engelbert Grünbacher, and Günter Edlinger</i>	85

People with Motor Disabilities: How to Improve Text Input

Text Composing Software for Disabled People, Using Blink and Motion Detection <i>Philipp Hofmann, Matthias Söllner, and Josef Pösl</i>	91
Augmented and Alternative Communication System Based on Dasher Application and an Accelerometer <i>Isabel Gómez, Pablo Anaya, Rafael Cabrera, Alberto J. Molina, Octavio Rivera, and Manuel Merino</i>	98
Evaluation of WordTree System with Motor Disabled Users <i>Georges Badr and Mathieu Raynal</i>	104
Evaluation of SpreadKey System with Motor Impaired Users <i>Bruno Merlin and Mathieu Raynal</i>	112
An Integrated Text Entry System Design for Severe Physical Disabilities <i>Yun-Lung Lin, Ming-Chung Chen, Yao-Ming Yeh, and Chih-Ching Yeh</i>	120

Qanti: A Software Tool for Quick Ambiguous Non-standard Text Input	128
<i>Torsten Felzer, Ian Scott MacKenzie, Philipp Beckerle, and Stephan Rinderknecht</i>	
A Prototype Scanning System with an Ambiguous Keyboard and a Predictive Disambiguation Algorithm	136
<i>Julio Miró-Borrás, Pablo Bernabeu-Soler, Raul Llinares, and Jorge Igual</i>	
An Ambiguous Keyboard Based on “Character Graphical Association” for the Severely Physically Handicapped	140
<i>Julio Miró-Borrás, Pablo Bernabeu-Soler, Raul Llinares, and Jorge Igual</i>	
Deaf and Hard of Hearing People: Accessible Information and Education	
The Deaf and Online Comprehension Texts, How Can Technology Help?	144
<i>Simona Ottaviano, Gianluca Merlo, Antonella Chifari, Giuseppe Chiazese, Luciano Seta, Mario Allegra, and Valentina Samperi</i>	
Extraction of Displayed Objects Corresponding to Demonstrative Words for Use in Remote Transcription	152
<i>Yoshinori Takeuchi, Hajime Ohta, Noboru Ohnishi, Daisuke Wakatsuki, and Hiroki Minagawa</i>	
E-Scribe: Ubiquitous Real-Time Speech Transcription for the Hearing-Impaired	160
<i>Zdenek Bumbalek, Jan Zelenka, and Lukas Kencl</i>	
SportSign: A Service to Make Sports News Accessible to Deaf Persons in Sign Languages	169
<i>Achraf Othman, Oussama El Ghouli, and Mohamed Jemni</i>	
Synote: Accessible and Assistive Technology Enhancing Learning for All Students	177
<i>Mike Wald</i>	
Teaching English to Deaf Adults: “SignOnOne” – An Online Course for Beginners	185
<i>Marlene Hilzensauer</i>	

Deaf People: AT for Sign Language

A Web Based Platform for Sign Language Corpus Creation	193
<i>Davide Barberis, Nicola Garazzino, Elio Piccolo, Paolo Prinetto, and Gabriele Tiotto</i>	
Context Analysis of Universal Communication through Local Sign Languages Applying Multivariate Analysis	200
<i>Naotsune Hosono, Hiromitsu Inoue, and Yuji Nagashima</i>	
Toward Automatic Sign Language Recognition from Web3D Based Scenes	205
<i>Kabil Jaballah and Mohamed Jemni</i>	
Introducing Arabic Sign Language for Mobile Phones	213
<i>Hend S. Al-Khalifa</i>	
Sign Language Interpreter Module: Accessible Video Retrieval with Subtitles	221
<i>Primož Kosec, Matjaž Debevc, and Andreas Holzinger</i>	

Blind and Partially Sighted People: Mobility and Interaction without Sight

Real-Time Walk Light Detection with a Mobile Phone	229
<i>Volodymyr Ivanchenko, James Coughlan, and Huiying Shen</i>	
An Ultrasonic Blind Guidance System for Street Crossings	235
<i>Satoshi Hashino and Sho Yamada</i>	
Pedestrian Navigation System Using Tone Gradient and Robotic GIS . . .	239
<i>Takafumi Ienaga, Yukinobu Sugimura, Yoshihiko Kimuro, and Chikamune Wada</i>	
MOST-NNG, an Accessible GPS Navigation Application Integrated into the MOBILE Slate Talker (MOST) for the Blind	247
<i>Norbert Márkus, András Arató, Zoltán Juhász, Gábor Bognár, and László Késmárki</i>	
Improving Computer Vision-Based Indoor Wayfinding for Blind Persons with Context Information	255
<i>YingLi Tian, Chucai Yi, and Aries Arditi</i>	
Computer Vision-Based Door Detection for Accessibility of Unfamiliar Environments to Blind Persons	263
<i>Yingli Tian, Xiaodong Yang, and Aries Arditi</i>	
Development and Installation of Programmable Light-Emitting Braille Blocks	271
<i>Makoto Kobayashi and Hiroshi Katoh</i>	

FLIPPS for the Blind - An Object Detector for Medium Distances Using Concerted Fingertip Stimulation	275
<i>Hans-Heinrich Bothe and Sermed Al-Hamdani</i>	
Camera Based Target Acquisition Augmented with Phosphene Sensations	282
<i>Tatiana G. Evreinova, Grigori Evreinov, and Roope Raisamo</i>	
A Mobile Phone Application Enabling Visually Impaired Users to Find and Read Product Barcodes	290
<i>Ender Tekin and James M. Coughlan</i>	
A Model to Develop Videogames for Orientation and Mobility	296
<i>Jaime Sánchez, Luis Guerrero, Mauricio Sáenz, and Héctor Flores</i>	
Underestimated Cerebral Visual Impairment Requires Innovative Thinking When Using AT	304
<i>Michael Cyrus and Frank Lunde</i>	

Blind and Partially Sighted People: Rehabilitation and Social Skills

Eye Tracking for Low Vision Aids - Toward Guiding of Gaze	308
<i>Yasuyuki Murai, Masaji Kawahara, Hisayuki Tatsumi, Iwao Sekita, and Masahiro Miyakawa</i>	
Assistive Technologies as Effective Mediators in Interpersonal Social Interactions for Persons with Visual Disability	316
<i>Sreekar Krishna and Sethuraman Panchanathan</i>	
Clothes Matching for Blind and Color Blind People	324
<i>Yingli Tian and Shuai Yuan</i>	
A Basic Inspection of Wall-Climbing Support System for the Visually Challenged	332
<i>Makoto Kobayashi</i>	
Makeup Support System for Visually Impaired Persons: Overview of System Functions	338
<i>Akihiko Hanafusa, Shuri Terada, Yuuri Miki, Chiharu Sasagawa, Tomozumi Ikeda, and Teruhiko Fuwa</i>	

Blind and Partially Sighted People: HCI

WebTrax: Visualizing Non-Visual Web Interactions	346
<i>Jeffrey P. Bigham and Kyle Murray</i>	

A Context-Based Grammar Generation in Mixed Initiative Dialogue System for Visually Impaired	354
<i>Jaromír Plhák</i>	
Design and Development of Spoken Dialog Systems Incorporating Speech Synthesis of Viennese Varieties	361
<i>Michael Pucher, Friedrich Neubarth, and Dietmar Schabus</i>	
Methods for the Visually Impaired to Retrieve Audio Information Efficiently	367
<i>Atsushi Imai, Nobumasa Seiyama, Tohru Takagi, and Tohru Ifukube</i>	
Binocular Vision Impairments Therapy Supported by Contactless Eye-Gaze Tracking System	373
<i>Lukasz Kosikowski and Andrzej Czyżewski</i>	
Realization of Direct Manipulation for Visually Impaired on Touch Panel Interface	377
<i>Tatsumi Nishizawa, Daisuke Nagasaka, Hiroshi Kodama, Masami Hashimoto, Kazunori Itoh, and Seiji Miyaoka</i>	
Inspired by Sharp Vision: The Full HD Desktop Video Magnifier “Eagle”	385
<i>Maria Schiewe, Thorsten Völkel, and Dirk Kochanek</i>	

Blind and Partially Sighted People: Access to Mathematics

Non-sequential Mathematical Notations in the LAMBDA System	389
<i>Cristian Bernareggi</i>	
MathML to ASCII-Braille and Hierarchical Tree Converter	396
<i>Silvia Fajardo-Flores, Maria Andrade-Arechiga, Alfonso Flores-Barriga, and Juan Lazaro-Flores</i>	
Tactile Graphic Tool for Portable Digital Pad	403
<i>Thamburaj Robinson and Atulya K. Nagar</i>	
Spoken Mathematics Using Prosody, Earcons and Spearcons	407
<i>Enda Bates and Dónal Fitzpatrick</i>	
On Necessity of a New Method to Read Out Math Contents Properly in DAISY	415
<i>Katsuhito Yamaguchi and Masakazu Suzuki</i>	
Innovative Methods for Accessing Mathematics by Visually Impaired Users	423
<i>Giuseppe Nicotra, Giovanni Bertoni, Enrico Bortolazzi, and Luciana Formenti</i>	

Blind and Partially Sighted People: Designing Haptic Interaction for a Collaborative World

ICCHP Keynote:

Designing Haptic Interaction for a Collaborative World	431
<i>Gerhard Weber</i>	
Improving the Accessibility of ASCII Graphics for the Blind Students: Producing My Own Graphics	439
<i>Karin Müller and Angela Constantinescu</i>	
Development of a Musical Score System Using Body-Braille	443
<i>Satoshi Ohtsuka, Nobuyuki Sasaki, Sadao Hasegawa, and Tetsumi Harakawa</i>	
Analysis of Awareness while Touching the Tactile Figures Using Near-Infrared Spectroscopy	447
<i>Takayuki Shiose, Yasuhiro Kagiya, Kentaro Toda, Hiroshi Kawakami, Kiyohide Ito, Akira Takatsuki, and Akitoshi Seiyama</i>	
Development of Directly Manipulable Tactile Graphic System with Audio Support Function	451
<i>Shigenobu Shimada, Haruka Murase, Suguru Yamamoto, Yusuke Uchida, Makoto Shimojo, and Yutaka Shimizu</i>	
AutOMathic Blocks: Supporting Learning Games for Young Blind Students	459
<i>Arthur I. Karshmer and Ken Paap</i>	
Audio-Haptic Browser for a Geographical Information System	466
<i>Limin Zeng and Gerhard Weber</i>	
A Graphical Tactile Screen-Explorer	474
<i>Martin Spindler, Michael Kraus, and Gerhard Weber</i>	
Reading Braille and Tactile Ink-Print on a Planar Tactile Display	482
<i>Denise Prescher, Oliver Nadig, and Gerhard Weber</i>	
Enhancing Single Touch Gesture Classifiers to Multitouch Support	490
<i>Michael Schmidt and Gerhard Weber</i>	
User-Interface Filter for Two-Dimensional Haptic Interaction	498
<i>Wiebke Köhlmann, Francis Zinke, Maria Schiewe, and Helmut Jürgensen</i>	

Improving Screen Magnification Using the HyperBraille Multiview Windowing Technique	506
<i>Christiane Taras, Michael Raschke, Thomas Schlegel, Thomas Ertl, Denise Prescher, and Gerhard Weber</i>	

Blind and Partially Sighted People: Three-Dimensional Tactile Models for Blind People and Recognition of 3D Objects by Touch

Three-Dimensional Tactile Models for Blind People and Recognition of 3D Objects by Touch: Introduction to the Special Thematic Session	513
<i>Yoshinori Teshima</i>	
Models of Mathematically Defined Curved Surfaces for Tactile Learning	515
<i>Yoshinori Teshima, Tohru Ogawa, Mamoru Fujiyoshi, Yuji Ikegami, Takeshi Kaneko, Susumu Oouchi, Yasunari Watanabe, and Kenji Yamazawa</i>	
Enlarged Skeleton Models of Plankton for Tactile Teaching	523
<i>Yoshinori Teshima, Atsushi Matsuoka, Mamoru Fujiyoshi, Yuji Ikegami, Takeshi Kaneko, Susumu Oouchi, Yasunari Watanabe, and Kenji Yamazawa</i>	
Reproduction of Tactile Paintings for Visual Impairments Utilized Three-Dimensional Modeling System and the Effect of Difference in the Painting Size on Tactile Perception	527
<i>Susumu Oouchi, Kenji Yamazawa, and Lorreta Secchi</i>	
Tactile Map Automated Creation System to Enhance the Mobility of Blind Persons-Its Design Concept and Evaluation through Experiment	534
<i>Kazunori Minatani, Tetsuya Watanabe, Toshimitsu Yamaguchi, Ken Watanabe, Joji Akiyama, Manabi Miyagi, and Susumu Oouchi</i>	
Development of Tactile Graphics Production Software for Three-Dimensional Projections	541
<i>Mamoru Fujiyoshi, Takeshi Kaneko, Akio Fujiyoshi, Susumu Oouchi, Kenji Yamazawa, Yuji Ikegami, Yasunari Watanabe, and Yoshinori Teshima</i>	
Comprehending and Making Drawings of 3D Objects by Visually Impaired People: Research on Drawings of Geometric Shapes by Various Methods of Projection	548
<i>Takeshi Kaneko, Mamoru Fujiyoshi, Susumu Oouchi, Yoshinori Teshima, Yuji Ikegami, Yasunari Watanabe, and Kenji Yamazawa</i>	

Ageing: HCI Usability (HCI4AGING)

Human-Computer Interaction and Usability Engineering for Elderly (HCI4AGING):

Introduction to the Special Thematic Session	556
<i>Andreas Holzinger, Martina Ziefle, and Carsten Röcker</i>	
A Device to Evaluate Broadcast Background Sound Balance Using Loudness for Elderly Listeners	560
<i>Tomoyasu Komori, Tohru Takagi, Koichi Kurozumi, Kiyotake Shoda, and Kazuhiro Murakawa</i>	
Automatic Live Monitoring of Communication Quality for Normal-Hearing and Hearing-Impaired Listeners	568
<i>Jan Rennies, Eugen Albertin, Stefan Goetze, and Jens-E. Appell</i>	
Portrait: Portraying Individuality	576
<i>Gemma Webster, Deborah I. Fels, Gary Gowans, and Norman Alm</i>	
Mental Models of Menu Structures in Diabetes Assistants	584
<i>André Calero Valdez, Martina Ziefle, Firat Alagöz, and Andreas Holzinger</i>	
Touch Screen User Interfaces for Older Subjects: Effect of the Targets Number and the Two Hands Use	592
<i>Guillaume Lepicard and Nadine Vigouroux</i>	
Using a Wearable Insole Gait Analyzing System for Automated Mobility Assessment for Older People	600
<i>Johannes Oberzaucher, Harald Jagos, Christian Zödl, Walter Hlauschek, and Wolfgang Zagler</i>	
Author Index	605