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HCI International 2020 – Late Breaking Papers

Universal Access and Inclusive Design

22nd HCI International Conference, HCII 2020 Copenhagen, Denmark, July 19–24, 2020 Proceedings



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Foreword

The 22nd International Conference on Human-Computer Interaction, HCI International 2020 (HCII 2020), was planned to be held at the AC Bella Sky Hotel and Bella Center, Copenhagen, Denmark, during July 19–24, 2020. Due to the COVID-19 pandemic and the resolution of the Danish government not to allow events larger than 500 people to be hosted until September 1, 2020, HCII 2020 had to be held virtually. It incorporated the 21 thematic areas and affiliated conferences listed on the following page.

A total of 6,326 individuals from academia, research institutes, industry, and governmental agencies from 97 countries submitted contributions, and 1,439 papers and 238 posters were included in the volumes of the proceedings published before the conference. Additionally, 333 papers and 144 posters are included in the volumes of the proceedings published after the conference, as "Late Breaking Work" (papers and posters). These contributions address the latest research and development efforts in the field and highlight the human aspects of design and use of computing systems.

The volumes comprising the full set of the HCII 2020 conference proceedings are listed in the following pages and together they broadly cover the entire field of human-computer interaction, addressing major advances in knowledge and effective use of computers in a variety of application areas.

I would like to thank the Program Board Chairs and the members of the Program Boards of all Thematic Areas and Affiliated Conferences for their valuable contributions towards the highest scientific quality and the overall success of the HCI International 2020 conference.

This conference would not have been possible without the continuous and unwavering support and advice of the founder, conference general chair emeritus and conference scientific advisor, Prof. Gavriel Salvendy. For his outstanding efforts, I would like to express my appreciation to the communications chair and editor of HCI International News, Dr. Abbas Moallem.

July 2020

Constantine Stephanidis

HCI International 2020 Thematic Areas and Affiliated Conferences

Thematic Areas:

- HCI 2020: Human-Computer Interaction
- HIMI 2020: Human Interface and the Management of Information

Affiliated Conferences:

- EPCE: 17th International Conference on Engineering Psychology and Cognitive Ergonomics
- UAHCI: 14th International Conference on Universal Access in Human-Computer Interaction
- VAMR: 12th International Conference on Virtual, Augmented and Mixed Reality
- CCD: 12th International Conference on Cross-Cultural Design
- SCSM: 12th International Conference on Social Computing and Social Media
- AC: 14th International Conference on Augmented Cognition
- DHM: 11th International Conference on Digital Human Modeling & Applications in Health, Safety, Ergonomics & Risk Management
- DUXU: 9th International Conference on Design, User Experience and Usability
- DAPI: 8th International Conference on Distributed, Ambient and Pervasive Interactions
- HCIBGO: 7th International Conference on HCI in Business, Government and Organizations
- LCT: 7th International Conference on Learning and Collaboration Technologies
- ITAP: 6th International Conference on Human Aspects of IT for the Aged Population
- HCI-CPT: Second International Conference on HCI for Cybersecurity, Privacy and Trust
- HCI-Games: Second International Conference on HCI in Games
- MobiTAS: Second International Conference on HCI in Mobility, Transport and Automotive Systems
- AIS: Second International Conference on Adaptive Instructional Systems
- C&C: 8th International Conference on Culture and Computing
- MOBILE: First International Conference on Design, Operation and Evaluation of Mobile Communications
- AI-HCI: First International Conference on Artificial Intelligence in HCI

Conference Proceedings – Full List of Volumes

- 1. LNCS 12181, Human-Computer Interaction: Design and User Experience (Part I), edited by Masaaki Kurosu
- 2. LNCS 12182, Human-Computer Interaction: Multimodal and Natural Interaction (Part II), edited by Masaaki Kurosu
- 3. LNCS 12183, Human-Computer Interaction: Human Values and Quality of Life (Part III), edited by Masaaki Kurosu
- 4. LNCS 12184, Human Interface and the Management of Information: Designing Information (Part I), edited by Sakae Yamamoto and Hirohiko Mori
- 5. LNCS 12185, Human Interface and the Management of Information: Interacting with Information (Part II), edited by Sakae Yamamoto and Hirohiko Mori
- 6. LNAI 12186, Engineering Psychology and Cognitive Ergonomics: Mental Workload, Human Physiology, and Human Energy (Part I), edited by Don Harris and Wen-Chin Li
- 7. LNAI 12187, Engineering Psychology and Cognitive Ergonomics: Cognition and Design (Part II), edited by Don Harris and Wen-Chin Li
- 8. LNCS 12188, Universal Access in Human-Computer Interaction: Design Approaches and Supporting Technologies (Part I), edited by Margherita Antona and Constantine Stephanidis
- 9. LNCS 12189, Universal Access in Human-Computer Interaction: Applications and Practice (Part II), edited by Margherita Antona and Constantine Stephanidis
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- 11. LNCS 12191, Virtual, Augmented and Mixed Reality: Industrial and Everyday Life Applications (Part II), edited by Jessie Y.C. Chen and Gino Fragomeni
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- 23. LNCS 12203, Distributed, Ambient and Pervasive Interactions, edited by Norbert Streitz and Shin'ichi Konomi
- 24. LNCS 12204, HCI in Business, Government and Organizations, edited by Fiona Fui-Hoon Nah and Keng Siau
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- 31. LNCS 12211, HCI in Games, edited by Xiaowen Fang
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- 39. CCIS 1225, HCI International 2020 Posters (Part II), edited by Constantine Stephanidis and Margherita Antona

- 40. CCIS 1226, HCI International 2020 Posters (Part III), edited by Constantine Stephanidis and Margherita Antona
- 41. LNCS 12423, HCI International 2020 Late Breaking Papers: User Experience Design and Case Studies, edited by Constantine Stephanidis, Aaron Marcus, Elizabeth Rosenzweig, P.L. Patrick Rau, Abbas Moallem, and Matthias Rauterberg
- 42. LNCS 12424, HCI International 2020 Late Breaking Papers: Multimodality and Intelligence, edited by Constantine Stephanidis, Masaaki Kurosu, Helmut Degen, and Lauren Reinerman-Jones
- 43. LNCS 12425, HCI International 2020 Late Breaking Papers: Cognition, Learning and Games, edited by Constantine Stephanidis, Don Harris, Wen-Chin Li, Dylan D. Schmorrow, Cali M. Fidopiastis, Panayiotis Zaphiris, Andri Ioannou, Xiaowen Fang, Robert Sottilare, and Jessica Schwarz
- 44. LNCS 12426, HCI International 2020 Late Breaking Papers: Universal Access and Inclusive Design, edited by Constantine Stephanidis, Margherita Antona, Qin Gao, and Jia Zhou
- 45. LNCS 12427, HCI International 2020 Late Breaking Papers: Interaction, Knowledge and Social Media, edited by Constantine Stephanidis, Sakae Yamamoto, Hirohiko Mori, Gabriele Meiselwitz, Fiona Fui-Hoon Nah, and Keng Siau
- 46. LNCS 12428, HCI International 2020 Late Breaking Papers: Virtual and Augmented Reality, edited by Constantine Stephanidis, Jessie Y.C. Chen, and Gino Fragomeni
- 47. LNCS 12429, HCI International 2020 Late Breaking Papers: Digital Human Modeling and Ergonomics, Mobility and Intelligent Environments, edited by Constantine Stephanidis, Vincent G. Duffy, Norbert Streitz, Shin'ichi Konomi, and Heidi Krömker
- 48. CCIS 1293, HCI International 2020 Late Breaking Posters (Part I), edited by Constantine Stephanidis, Margherita Antona, and Stavroula Ntoa
- 49. CCIS 1294, HCI International 2020 Late Breaking Posters (Part II), edited by Constantine Stephanidis, Margherita Antona, and Stavroula Ntoa



http://2020.hci.international/proceedings

HCI International 2020 (HCII 2020)

The full list with the Program Board Chairs and the members of the Program Boards of all thematic areas and affiliated conferences is available online at:

http://www.hci.international/board-members-2020.php



HCI International 2021

The 23rd International Conference on Human-Computer Interaction, HCI International 2021 (HCII 2021), will be held jointly with the affiliated conferences in Washington DC, USA, at the Washington Hilton Hotel, July 24–29, 2021. 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 will be available on the conference website: http://2021.hci.international/

General Chair Prof. Constantine Stephanidis University of Crete and ICS-FORTH Heraklion, Crete, Greece Email: general_chair@hcii2021.org

http://2021.hci.international/



Contents

Design for All Methods, Techniques and Tools	
Co-design of Augmented Reality Storybooks for Children with Autism Spectrum Disorder	3
Bushra Alkadhi, Ghadah Alnafisi, Layan Aljowair, Leena Alotaibi, Nouf Alduaifi, and Raghad Alhumood	
Empowering Assistive Technology Communities to Make Strategic Use of Intellectual Property: Three Case Studies from	
the CoCreate Program	14
Humanistic Co-design for Specific Learning Difficulties Using Scenario-Based Personas: Tangible Arabic Alphabet Blocks for Dyslexia Mawaddah AlSabban, Sundus Alorij, Ghadeer Alshamrani, and Ohoud Alharbi	24
Heuristic Evaluation for the Assessment of Inclusive Tools in the Autism Treatment	34
Persona Design in Participatory Agile Software Development	52
A Web Authoring Tool for the Generation of Adventure Educational Games for Deaf Children	65
Toward a Disability-Centric Model of User Participation in Accessibility Efforts: Lessons from a Case Study of School Children	76
Institutionalizing Universal Design: How Organizational Practices Can Promote Web Accessibility	87
Development of a Multilingual Questionnaire for the Deaf Community – Guidelines and Challenges	103

MOOC Accessibility from the Educator Perspective	114
User-Centred Design for Accessibility in Media Content – Sign Language and Virtual Signer	126
Contribution of Clinical Data to the Design of Assistive Systems Frédéric Vella, Nadine Vigouroux, Rozenn Baudet, Antonio Serpa, Philippe Truillet, Xavier Carrau, Jean-François Camps, Caroline Mercardier, Charline Calmels, Karine Gigaud, Victoria Fourgous, and Mélodie Blanchard	144
Accessibility Solutions and User Experience	
Designing SignSpeak, an Arabic Sign Language Recognition System Abeer Al-Nafjan, Layan Al-Abdullatef, Mayar Al-Ghamdi, Nada Al-Khalaf, and Wejdan Al-Zahrani	161
Co-design of Color Identification Applications Using Scenario-Based Personas for People with Impaired Color Vision	171
Proposal for an Interactive Software System Design for Learning Mexican Sign Language with Leap Motion	184
Designing a Tangible User Interface for Braille Teaching	197
Understanding Pattern Recognition Through Sound with Considerations for Developing Accessible Technologies	208
Method for Synchronized Driving of Sign Language Avatar Using a Digital TV Signal	220

Care4MyHeart-PSG: A Personalized Serious Game Platform to Empower Phase III Cardiac Rehabilitation of Cardiovascular Disease Patients	
in UAE	233
The HapBack: Evaluation of Absolute and Relative Distance Encoding to Enhance Spatial Awareness in a Wearable Tactile Device	251
Automatic Contrast Evaluation for Android Themes	267
A Low-Cost Gaze-Based Arabic Augmentative and Alternative Communication System for People with Severe Speech and Motor Impairments	279
Rotate-and-Press: A Non-visual Alternative to Point-and-Click?	291
Augmented Reality as a Tool to Support the Inclusion of Colorblind People	306
Sign Language Interpreter Detection Method for Live TV Broadcast Content	318
Tech-Inclusion Research: An Iconographic Browser Extension Solution Tânia Rocha, Hugo Paredes, Paulo Martins, and João Barroso	333
Development of Night Time Calling System by Eye Movement Using Wearable Camera	345
EyeHear: Smart Glasses for the Hearing Impaired	358

on Interaction for People with Disabilities	37
Pedro Teixeira, Diana Lemos, Maria João Carneiro, Celeste Eusébio, and Leonor Teixeira	37.
A Context Driven Indoor Localization Framework for Assisted Living in Smart Homes	38′
Social Intervention Strategy of Augmented Reality Combined with Theater-Based Games to Improve the Performance of Autistic Children in Symbolic Play and Social Skills	40
Optimized User Experience Design for Augmentative and Alternative Communication via Mobile Technology: Using Gamification to Enhance Access and Learning for Users with Severe Autism	412
A Head Mouse Alternative Solution Proposal for People with Motor Impairments: Design and Usability Assessment Study	429
Design for Aging	
Assisted Caretaking System for Geriatric Home Care. Isabel Barroso, Salviano Soares, Vitor Rodrigues, Sérgio Silva, Maria João Monteiro, Conceição Rainho, Diogo Duarte, and António Valente	439
UCD in AAL: Status Quo and Perceived Fit	450
Defining Digital Joy-of-Use Criteria for Seniors: An Applied Design Approach to Build Motivational User Experiences for Older Generations Michel Bauer, Bruno M. C. Silva, and Carlos Rosa	470
Study on Acceptance of Social Robots by Aging Adults Living Alone Na Chen, Xiaoyu Liu, and Yue Sun	482
Designing for Experiences in Blended Reality Environments for People with Dementia	49:
Exploring the Contextual Relationship of Narrating Life Stories by Elderly People	510

Contents	xxi

Designing Digital Technologies and Safeguards for Improving Activities and Well-Being for Aging in Place	524
Digital Health Engineering and Entrepreneurial Innovation – Education for the Development of ICT for Older Adults	538
Practical Implementation of an Innovative Design Aimed at Increasing Enthusiasm for Exercise Among the Elderly	549
Research on GP-GC Intergeneration Affective Interaction Product Design: Analysis from Chinese Social Perspective to Value Proposition	564
Discriminative Model for Identifying Motion Primitives Based on Virtual Reality-Based IADL	574
Maiko Sakamoto, and Hayato Ohwada The Relationship Between the Seniors' Appraisal of Cognitive-Training	
Games and Game-Related Stress Is Complex: A Mixed-Methods Study Najmeh Khalili-Mahani, Bob de Schutter, and Kim Sawchuk	586
Application of Game Therapy in the Health of Future Elderly: An Experience Design Perspective	608
Construction and Evaluation of Situational System for Introducing Interactive Technology into Ecotourism of Active Aging Group Li-Shu Lu, PeiFen Wu, and Guan-Yuan Huan	626
An Age-Friendly System Design for Smart Home: Findings from Heuristic Evaluation	643
Mobile Application to Record Daily Life for Seniors Based on Experience Sampling Method (ESM)	660
A Preliminary Study on Reaching Position Estimation Model for the Subtle Action Disruption	670

Approaching Behavior Analysis for Improving a Mobile Communication	670
Robot in a Nursing Home	679
User-centered Implementation of Rehabilitation Exercising on an Assistive Robotic Platform. Xanthi S. Papageorgiou, George Tsampounaris, Alexandra Karavasili, Eleni Efthimiou, Stavroula-Evita Fotinea, Anna Vacalopoulou, Panagiotis Karioris, Fotini Koureta, Despina Alexopoulou, and Dimitris Dimou	689
"The Terms and Conditions Came Back to Bite": Plain Language and Online Financial Content for Older Adults	699
Security, Privacy and Trust for a Crowd-Sourced Semantic Accessibility Database for Public Transport. Daniel Tabellion, Moritz Wolf, Jochen Britz, Maurice Rekrut, and Jan Alexandersson	712
Design Education Regarding Products for Use by Elderly People	728
A Framework for Monitoring Indoor Navigational Hazards and Safety of Elderly	737
Perceived Self-efficacy in Parkinson's Disease Through Mobile Health Monitoring	749
Research on Cognitive Training of Digital Application System Introducing Reminiscence Therapy for the Experience of People with Dementia PeiFen Wu, Hui-Jiun Hu, WenFu Wang, KuangYi Fan, and ChunWe Huang	763
Author Index	779