Communications in Computer and Information Science 852

Commenced Publication in 2007
Founding and Former Series Editors:
Alfredo Cuzzocrea, Xiaoyong Du, Orhun Kara, Ting Liu, Dominik Ślęzak, and Xiaokang Yang

Editorial Board

Simone Diniz Junqueira Barbosa
Pontifical Catholic University of Rio de Janeiro (PUC-Rio), Rio de Janeiro, Brazil

Phoebe Chen
La Trobe University, Melbourne, Australia

Joaquim Filipe
Polytechnic Institute of Setúbal, Setúbal, Portugal

Igor Kotenko
St. Petersburg Institute for Informatics and Automation of the Russian Academy of Sciences, St. Petersburg, Russia

Krishna M. Sivalingam
Indian Institute of Technology Madras, Chennai, India

Takashi Washio
Osaka University, Osaka, Japan

Junsong Yuan
University at Buffalo, The State University of New York, Buffalo, USA

Lizhu Zhou
Tsinghua University, Beijing, China

More information about this series at http://www.springer.com/series/7899

Constantine Stephanidis (Ed.)

HCI International 2018 – Posters' Extended Abstracts

20th International Conference, HCI International 2018
Las Vegas, NV, USA, July 15–20, 2018
Proceedings, Part III

Springer

Editor
Constantine Stephanidis
University of Crete
and Foundation for Research
and Technology – Hellas (FORTH)
Heraklion, Crete
Greece

ISSN 1865-0929 ISSN 1865-0937 (electronic)
Communications in Computer and Information Science
ISBN 978-3-319-92284-3 ISBN 978-3-319-92285-0 (eBook)
https://doi.org/10.1007/978-3-319-92285-0

Library of Congress Control Number: 2018944385

© Springer International Publishing AG, part of Springer Nature 2018
This work is subject to copyright. All rights are reserved by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.
The use of general descriptive names, registered names, trademarks, service marks, 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.
The publisher, the authors and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, express or implied, with respect to the material contained herein or for any errors or omissions that may have been made. The publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Printed on acid-free paper

This Springer imprint is published by the registered company Springer International Publishing AG
part of Springer Nature
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

Foreword

The 20th International Conference on Human-Computer Interaction, HCI International 2018, was held in Las Vegas, NV, USA, during July 15–20, 2018. The event incorporated the 14 conferences/thematic areas listed on the following page.

A total of 4,373 individuals from academia, research institutes, industry, and governmental agencies from 76 countries submitted contributions, and 1,170 papers and 195 posters have been included in the proceedings. These contributions address the latest research and development efforts and highlight the human aspects of design and use of computing systems. The contributions 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. The volumes constituting the full set of the conference proceedings are listed in the following pages.

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 contribution to the highest scientific quality and the overall success of the HCI International 2018 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 2018 Constantine Stephanidis

HCI International 2018 Thematic Areas and Affiliated Conferences

Thematic areas:

- Human-Computer Interaction (HCI 2018)
- Human Interface and the Management of Information (HIMI 2018)

Affiliated conferences:

- 15th International Conference on Engineering Psychology and Cognitive Ergonomics (EPCE 2018)
- 12th International Conference on Universal Access in Human-Computer Interaction (UAHCI 2018)
- 10th International Conference on Virtual, Augmented, and Mixed Reality (VAMR 2018)
- 10th International Conference on Cross-Cultural Design (CCD 2018)
- 10th International Conference on Social Computing and Social Media (SCSM 2018)
- 12th International Conference on Augmented Cognition (AC 2018)
- 9th International Conference on Digital Human Modeling and Applications in Health, Safety, Ergonomics, and Risk Management (DHM 2018)
- 7th International Conference on Design, User Experience, and Usability (DUXU 2018)
- 6th International Conference on Distributed, Ambient, and Pervasive Interactions (DAPI 2018)
- 5th International Conference on HCI in Business, Government, and Organizations (HCIBGO)
- 5th International Conference on Learning and Collaboration Technologies (LCT 2018)
- 4th International Conference on Human Aspects of IT for the Aged Population (ITAP 2018)

Conference Proceedings Volumes Full List

1. LNCS 10901, Human-Computer Interaction: Theories, Methods, and Human Issues (Part I), edited by Masaaki Kurosu
2. LNCS 10902, Human-Computer Interaction: Interaction in Context (Part II), edited by Masaaki Kurosu
3. LNCS 10903, Human-Computer Interaction: Interaction Technologies (Part III), edited by Masaaki Kurosu
4. LNCS 10904, Human Interface and the Management of Information: Interaction, Visualization, and Analytics (Part I), edited by Sakae Yamamoto and Hirohiko Mori
5. LNCS 10905, Human Interface and the Management of Information: Information in Applications and Services (Part II), edited by Sakae Yamamoto and Hirohiko Mori
6. LNAI 10906, Engineering Psychology and Cognitive Ergonomics, edited by Don Harris
7. LNCS 10907, Universal Access in Human-Computer Interaction: Methods, Technologies, and Users (Part I), edited by Margherita Antona and Constantine Stephanidis
8. LNCS 10908, Universal Access in Human-Computer Interaction: Virtual, Augmented, and Intelligent Environments (Part II), edited by Margherita Antona and Constantine Stephanidis
9. LNCS 10909, Virtual, Augmented and Mixed Reality: Interaction, Navigation, Visualization, Embodiment, and Simulation (Part I), edited by Jessie Y. C. Chen and Gino Fragomeni
10. LNCS 10910, Virtual, Augmented and Mixed Reality: Applications in Health, Cultural Heritage, and Industry (Part II), edited by Jessie Y. C. Chen and Gino Fragomeni
11. LNCS 10911, Cross-Cultural Design: Methods, Tools, and Users (Part I), edited by Pei-Luen Patrick Rau
12. LNCS 10912, Cross-Cultural Design: Applications in Cultural Heritage, Creativity, and Social Development (Part II), edited by Pei-Luen Patrick Rau
13. LNCS 10913, Social Computing and Social Media: User Experience and Behavior (Part I), edited by Gabriele Meiselwitz
14. LNCS 10914, Social Computing and Social Media: Technologies and Analytics (Part II), edited by Gabriele Meiselwitz
15. LNAI 10915, Augmented Cognition: Intelligent Technologies (Part I), edited by Dylan D. Schmorrow and Cali M. Fidopiastis
16. LNAI 10916, Augmented Cognition: Users and Contexts (Part II), edited by Dylan D. Schmorrow and Cali M. Fidopiastis
17. LNCS 10917, Digital Human Modeling and Applications in Health, Safety, Ergonomics, and Risk Management, edited by Vincent G. Duffy
18. LNCS 10918, Design, User Experience, and Usability: Theory and Practice (Part I), edited by Aaron Marcus and Wentao Wang

19. LNCS 10919, Design, User Experience, and Usability: Designing Interactions (Part II), edited by Aaron Marcus and Wentao Wang
20. LNCS 10920, Design, User Experience, and Usability: Users, Contexts, and Case Studies (Part III), edited by Aaron Marcus and Wentao Wang
21. LNCS 10921, Distributed, Ambient, and Pervasive Interactions: Understanding Humans (Part I), edited by Norbert Streitz and Shin'ichi Konomi
22. LNCS 10922, Distributed, Ambient, and Pervasive Interactions: Technologies and Contexts (Part II), edited by Norbert Streitz and Shin'ichi Konomi
23. LNCS 10923, HCI in Business, Government, and Organizations, edited by Fiona Fui-Hoon Nah and Bo Sophia Xiao
24. LNCS 10924, Learning and Collaboration Technologies: Design, Development and Technological Innovation (Part I), edited by Panayiotis Zaphiris and Andri Ioannou
25. LNCS 10925, Learning and Collaboration Technologies: Learning and Teaching (Part II), edited by Panayiotis Zaphiris and Andri Ioannou
26. LNCS 10926, Human Aspects of IT for the Aged Population: Acceptance, Communication, and Participation (Part I), edited by Jia Zhou and Gavriel Salvendy
27. LNCS 10927, Human Aspects of IT for the Aged Population: Applications in Health, Assistance, and Entertainment (Part II), edited by Jia Zhou and Gavriel Salvendy
28. CCIS 850, HCI International 2018 Posters Extended Abstracts (Part I), edited by Constantine Stephanidis
29. CCIS 851, HCI International 2018 Posters Extended Abstracts (Part II), edited by Constantine Stephanidis
30. CCIS 852, HCI International 2018 Posters Extended Abstracts (Part III), edited by Constantine Stephanidis

http://2018.hci.international/proceedings

HCI International 2018 Conference

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-2018.php

HCI International 2019

The 21st International Conference on Human-Computer Interaction, HCI International 2019, will be held jointly with the affiliated conferences in Orlando, FL, USA, at Walt Disney World Swan and Dolphin Resort, July 26–31, 2019. It will cover a broad spectrum of themes related to Human-Computer Interaction, 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://2019.hci.international/.

General Chair
Prof. Constantine Stephanidis
University of Crete and ICS-FORTH
Heraklion, Crete, Greece
E-mail: general_chair@hcii2019.org

http://2019.hci.international/

Contents – Part III

Learning and Interaction

CLIP 4 Robotics: A Click-Based Programming Language 3
Ali Al-Bayaty and Christopher Martinez

Complementary Learning Assist System: Guitar Performance Assist by Haptic Presentation 11
Kazushige Ashimori and Hiroshi Igarashi

Characterization of the Use of the Internet of Things in the Institutions of Higher Education of the City of Barranquilla and Its Metropolitan Area. . . 17
Leonel Hernandez, Genett Jimenez, Claudia Baloco, Angélica Jimenez, and Hugo Hernandez

Development of Gesture Recognition Education Game for Elementary School Students Personality Education 25
Sunghee Hong and Eunhye Kim

Integration of Kahoot into EFL Classroom 31
Yen-ju Hou

Utilizing HMD VR to Improve the Spatial Learning and Wayfinding Effects in the Virtual Maze 38
Tsuei-Ju (Tracy) Hsieh, Yu-Hsuan Kuo, and Chun-Kai Niu

The Psychological Cost of College Math: Digital Learning Behaviors, Outcomes, and Genders Differences 43
Xing Huang, Woonjon Hong, and Matthew Bernacki

Effects of Video Games on HBCU Students 51
Erick K. Huston II and Joon Suk Lee

Cognitive-Psychology-Based Study on Interactive Design of Preschool Children's Picture Books 59
Bin Jiang and Yuqiu Zhao

Sketching as a Modality in Intelligent Tutoring Systems 65
Rodney Long, Ken Forbus, Tom Hinrichs, and Samuel Hill

Making Video Tutorials in the Classroom – Tacit Knowledge on Display . . . 73
Gunver Majgaard and Lykke Bertel

CyanoHABIT: A Novel Game to Identify Harmful Freshwater Algae 78
Elizabeth A. Matthews, Robin A. Matthews, Zaina Sheets, and Juan E. Gilbert

iCE: An Intelligent Classroom Environment to Enhance Education in Higher Educational Institutions 85
Tarek H. Mokhtar, Ahmed Oteafy, Abd-Elhamid Taha, Nidal Nasser, and Samer E. Mansour

CodeLab: Designing a Conversation-Based Educational Tool for Learning to Code 94
Enric Mor, Francesc Santanach, Susanna Tesconi, and Carlos Casado

CognitOS: A Student-Centric Working Environment for an Attention-Aware Intelligent Classroom 102
Anastasia Ntagianta, Maria Korozi, Asterios Leonidis, Margherita Antona, and Constantine Stephanidis

Towards the Utilization of Diegetic UI in Virtual Reality Educational Content 111
Gapyuel Seo and Byung-Chull Bae

Teaching Introductory Programming Concepts Through a Gesture-Based Interface 116
Lora Streeter and John Gauch

Design Research on Customized Online Education Platform Catering to Business Demands 124
Yajie Wang, Xing Fang, and Ying Luo

A Framework for Mobile Learning Technology Usability Testing 131
Ruth Wario and Bonface Ngari

Egocentric Distance Perception Control for Direct Manipulation Interaction on HMD Platform 137
Ungyeon Yang, Nam-Gyu Kim, and Ki-Hong Kim

Media and Cognition Course: How to Cultivate Technical Leaders in Artificial Intelligence 143
Yi Yang and Jiasong Sun

Interacting with Cultural Heritage

The Research of Applying Interactive Design for a New Experience into Taiwan Traditional Matsu Culture 153
Yi-Chieh Chen and Chao-Ming Wang

Research on Prototype Design Methods and Systems of Interactive Media Art in Public Space 162
Yuanyuan Chen

Flow: A Musical Composition Tool Using Gesture Interactions and Musical Metacreation 169
Jordan Aiko Deja, Kevin Gray Chan, Migo Andres Dancel, Allen Vincent Gonzales, and John Patrick Tobias

Interaction with Immersive Cultural Heritage Environments Using Virtual Reality Technologies 177
Giannis Drossis, Chryssi Birliraki, and Constantine Stephanidis

Enhancing the Experience of Visiting Outdoor Heritage Sites Using Handheld AR 184
Mihai Duguleana and Gheorghe Daniel Voinea

The Way to Preserve Korean Intangible Cultural Assets. 192
Yang Kyu Lim and Jin Wan Park

Digital Heritage Technology at the Archaeological Museum of Heraklion . . . 196
Nikolaos Partarakis, Eirini Kontaki, Emmanouil Zidianakis, Giannis Drossis, Chryssi Birliraki, George Metaxakis, Alexandra Barka, Vaggelis Poutouris, George Mathioudakis, Ioanna Zidianaki, Antonis Chatziantoniou, Panagiotis Koutlemanis, Xenophon Zabulis, George Margetis, Dimitris Grammenos, Emmanouil Apostolakis, Emmanouil Stamatakis, Giorgos Paparoulis, Margherita Antona, and Constantine Stephanidis

Interactive City Information Point: Your Guide to Heraklion City 204
Nikolaos Partarakis, George Margetis, Emmanouil Zidianakis, Michalis Sifakis, Giannis Drossis, Chryssi Birliraki, Antonis Chatziantoniou, Vassiliki Neroutsou, Spiros Paparoulis, Thanasis Toutountzis, Panagiotis Koutlemanis, Xenophon Zabulis, Stavroula Ntoa, Dimitris Grammenos, Emmanouil Apostolakis, Emmanouil Stamatakis, Margherita Antona, and Constantine Stephanidis

Toward Human-Magic Interaction: Interfacing Biological, Tangible, and Cultural Technology 213
Pat Pataranutaporn and Kimberly Lyle

HCI in Commerce and Business

Using Multiple Research Methods to Inform Transformation of a Software Application into a Web Survey for Businesses 225
Amy Anderson Riemer

Validating Self-reported Trends Using WiFi Tracking 233
Daniel Ebeling, Zach Luker, Seth Pacheco, Angela Payne, and Nikki Rae

Competitive Intelligence in the Service Sector: A Data Visualization Approach 238
Oscar M. Granados and Oswaldo E. Velez-Langs

Chancho Assistant: Smart Shopping Guided by Consumer Habits 247
Fabián Gutiérrez Gómez and Rocío Abascal-Mena

Improve Onboarding Customer Experience and Reduce Airline Ground Staff Efforts Using Wearable 255
Abhishek Jain, Shiva Subhedar, and Naveen Kumar Gupta

Skip or Not to Skip: Impact of Empathy and Ad Length on Viewers' Ad-Skipping Behaviors on the Internet 261
Yongwoog Andrew Jeon

Research on Interactive Design of Interface Layout of Idle Resource Transactional Websites 266
Bin Jiang and Yitong Wang

Evaluation of Quality Management for Strategic Decision Making in Companies in the Plastic Sector of the Colombian Caribbean Region Using the TQM Diagnostic Report and Data Analysis 273
Genett Jimenez, Leonel Hernandez, Hugo Hernandez, Luis Cabas, and Jenny Ferreira

Diagnosis of Initial Conditions for the Implementation of the Integrated Management System in the Companies of the Land Cargo Transportation in the City of Barranquilla (Colombia). 282
Genett Jimenez, Laxmi Novoa, Laura Ramos, Jairo Martinez, and Cesar Alvarino

Developing Instructional Videos to Direct Business Respondents Through a Feature-Heavy Online Survey Instrument 290
Rebecca Keegan

Opinion Mining on Internet Primary Bank with Online News and Social Data 296
Dongmin Kim, Jihyung Hong, Yunjik Jeong, Jaehye Suk, Kee Ok Kim, and Hyesun Hwang

Modeling Conversational Flows for In-Store Mobile Decision Aids 302
Wi-Suk Kwon, Veena Chattaraman, Kacee Ross, Kiana Alikhademi, and Juan E. Gilbert

Changed the Cup, Not the Saucer – NFC Payments in Supermarkets 309
Poornigha Santhana Kumar, Michael Bechinie, and Manfred Tscheligi

Shadow-IT System and Insider Threat: An Assessment of an Opportunity Dimension for the Identity Theft 314
Asif Shaikh

The Research on the Benefit of Telemedicine to Human Based on Evolutionary Game Theory 318
Qing Xue, Lingchen Zhou, Jia Hao, and Minxia Liu

Training Demand Analysis for Airlines Safety Manager Based on Improved OTP Model 334
Yuan Zhang, Yanqiu Chen, Yijie Sun, and Mingliang Chen

Research on Future-Oriented Manager Service Design Under the Background of New Retail 343
Shifeng Zhao

Interacting and Driving

Human-Automation Interaction in Automated Vehicles: An Innovative HMI Design Approach. The Case of Elderly and Cyclists 359
Federico Fraboni, Marco De Angelis, David Plesnik, Andrea Altini, Marco Depolo, Bruna Zani, Gabriele Prati, and Luca Pietrantoni

Driver Drowsiness Detection Using EEG Features 367
Se-Hyeon Hwang, Myoungouk Park, Jonghwa Kim, Yongwon Yun, and Joonwoo Son

Head and Neck Supporting for Seating 375
Ghi-Hwei Kao and T. K. Philip Hwang

Generating Training Images Using a 3D City Model for Road Sign Detection 381
Ryuto Kato, Satoshi Nishiguchi, Wataru Hashimoto, and Yasuharu Mizutani

Knowledge Based Health Monitoring During Driving 387
Se Jin Park, Seunghee Hong, Damee Kim, Young Seo, and Iqram Hussain

"Voice Unlock" Function 393
Harim Seo and Younei Soe

A Simulator-Based Approach to Assess Take-over Performance in a Conditionally Automated Vehicle 398
Joonwoo Son, Sungryul Park, Myoungouk Park, Jinwoo Park, Jihyuk Park, Jonghwa Kim, and Yongwon Yun

Detection of Checking Action on Parking Significant for Cognitive Dysfunction Patients 404
Tomoji Toriyama, Akira Urashima, and Kanada Taisei

Study on UI of Charger in EV Charging Station 410
Wonseok Yang, Takanori Hirohashi, and Yeongchae Choi

Experimental Design for Multi-modal Take-over Request for Automated Driving. 418
Hanna Yun, Ji Won Lee, Hee Dong Yang, and Ji Hyun Yang

Designing Autonomous Driving HMI System: Interaction Need Insight and Design Tool Study 426
Yinshuai Zhang, Chun Yu, and Yuanchu Shi

Smart Cities and Smart Environments

Automation and Complacency: Insights from a Planning Task in the Transportation Domain 437
Eugénie Avril, Jordan Navarro, Liên Wioland, Benoit Valery, Virginie Govaere, Didier Gourc, Koosha Khademi, Christos Dimopoulos, Elisabeth Dargent, Nathalie Renaudeau, and Julien Cegarra

A Human Recognition System for Pedestrian Crosswalk 443
Chyi-Ren Dow, Liang-Hsuan Lee, Ngo Huu Huy, and Kuan-Chieh Wang

Modeling Design of Six-Freedom-Degree Collaboration Robot 448
Rongrong Fu and Ye Zhang

Implementation and Evaluation of a Reminder Registration Interface for Daily Life Objects 455
Kenro Go, Nagomu Horikoshi, Shion Tominaga, Jinta Nakamura, and Akihiro Miyata

Reconfigurable Spaces and Places in Smart Built Environments: A Service Centric Approach 463
Denis Gračanin, Mohamed Eltoweissy, Liang Cheng, and Reza Tasooji

Measurement of Motion Range to Improve of Body Balance and Its Training Contents 469
Dong-Yeon Kim, Sung-Wook Shin, Se-Jin Goo, and Sung-Taek Chung

Developing a Human Behavior Simulation System Based on Geometry Affordance 475
Yun Gil Lee

ParkCDMX: A Customized Parking App 480
Leticia Luna Tlatelpa and Rocío Abascal-Mena

Overcoming Space Inequalities in City Building Games Through Negotiation 487
Paola Monachesi

Instruvis: Play Music Virtually and Visualize the Data. 494
Ismail Ayaz and Elumalai Monisha

Identity Verification for Attendees of Large-Scale Events Using Face Recognition of Selfies Taken with Smartphone Cameras 501
Akitoshi Okumura, Takamichi Hoshino, Susumu Handa, Eiko Yamada, and Masahiro Tabuchi

Developing an Internet of Things (IoT) Service System Based on Spatial Context. 510
Hyo Jun Sim and Yun Gil Lee

A CDF-Based Symbolic Time-Series Data Mining Approach for Electricity Consumption Analysis. 515
I-Chin Wu, Yi-An Chen, and Zan-Xian Wang

Author Index 523