Lecture Notes in Computer Science

6243

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

Hyun Seung Yang Rainer Malaka Junichi Hoshino Jung Hyun Han (Eds.)

Entertainment Computing -ICEC 2010

9th International Conference, ICEC 2010 Seoul, Korea, September 8-11, 2010 Proceedings



Volume Editors

Hyun Seung Yang

KAIST, Department of Computer Science

373-1 Kusung-dong Yusung-gu, Daejeon, Korea 305-701

E-mail: hsyang@kaist.edu

Rainer Malaka

Universität Bremen, Technologie-Zentrum Informatik (TZI)

Postfach 330440, 28334 Bremen, Germany

E-mail: malaka@tzi.de

Junichi Hoshino

University of Tsukuba

Graduate School of Systems and Information Engineering

1-1-1 Tennoudai, Tsukuba, Ibaraki, 305-8573 Japan

E-mail: jhoshino@esys.tsukuba.ac.jp

Jung Hyun Han

Korea University, Department of Computer Science and Engineering

Anam-dong Seongbuk-gu, Seoul, Korea 136-701

E-mail: jhan@korea.ac.kr

Library of Congress Control Number: 2010932769

CR Subject Classification (1998): H.5.2, I.3, I.5, I.6, I.4, I.2

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

ISSN 0302-9743

ISBN-10 3-642-15398-4 Springer Berlin Heidelberg New York ISBN-13 978-3-642-15398-3 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

© IFIP International Federation for Information Processing 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

The 9th International Conference on Entertainment Computing (ICEC 2010) was held in September 2010 in Seoul Korea. After Pittsburgh (2008) and Paris (2009), the event returned to Asia.

The conference venue was the COEX Exhibition Hall in one of the most vivid and largest cities of the world. This amazing mega-city was a perfect location for the conference. Seoul is on the one hand a metropolitan area with modern industries, universities and great economic power. On the other hand, it is also a place with a very fascinating historical and cultural background. It bridges the past and the future as well as east and west.

Entertainment computing also aims at building bridges from technology to leisure, education, culture and work. Entertainment computing at its core has a strong focus on computer games. However, it is not only about computer games. The last ICEC conferences have shown that entertainment computing is a much wider field. For instance in games, technology developed for games can be used for a wide range of applications such as therapy or education. Moreover, entertainment does not necessarily have to be understood as games. Entertainment computing finds its way to stage performances and all sorts of new interactive installations.

In this sense, entertainment computing has the potential of influencing many other areas of computer science and engineering. But in contrast to other disciplines, entertainment computing always starts from the human experience and with the question of how to tell the users a story and how to immerse people into an entertaining world. Many critics of modern computer games believe that these technologies may distract people from the real world. In contrast to this, however, we are exploring the new medium of digital entertainment in order to expand classic media and their expressive power.

The presentations and papers of ICEC 2010 showed the broad spectrum of entertainment computing. The paper selection process was selective. Out of over 100 papers, 19 were accepted as long papers and 27 as short papers. With poster presentations we give researches the opportunities to present new ideas and also work in progress. The review process involved an international board of reviewers who put much effort into selecting an excellent set of papers for presentation.

For the highly influential conference, in addition to paper presentations, we put utmost effort in bringing together a number of distinguished keynote and invited speakers, global leaders representing a broad spectrum of entertainment computing fields; Roy Ascott (Media Theory, Art& Science), Susumu Tachi (VR&Telepresence), Keith Devlin(Media & Human Science), Don Marinelli (Entertainment Technology), George Joblove (Movie Industry), Shigeru Saito (Game Industry), Naoko Tosa (Culture &Media Art), Norico Wada (Animation&Contents), Junichi Osada (HRI&

Robot Design), Zenjiro (Comedy&Performance), Tomonaka Takahashi (Robot Design). We also organized five workshops dealing with hot issues including Culture Computing and Media Arts, 3D Stereoscopic Technology and Contents Production, The Awakening of Asian Animation and Content Power, Improvisational Acting, Spatial Sound and Entertainment Computing.

We would like to thank all Organizing Committee/Program Committee members and all supporting organizations that helped to make this event possible: The IFIP as the leading supporting organization of ICEC and the IFIP TC14 as the sponsoring organization. We specially thank Yeong Nam Chae and all other graduate students and staff of the KAIST AIM Lab for their tremendous effort in the preparation and assistance of all main programs and wonderful activities of ICEC2010.

July 2010

Hyun Seung Yang Rainer Malaka, Junichi Hoshino Jung Hyun Han

Organization

Honorary Chairs

Roy Ascott Planetary Collegium and CAiiA, USA

Susumu Tachi University of Tokyo and Keio University, Japan

General Chairs

Hyun Seung Yang KAIST, Korea

Ryohei Nakatsu IDMI NUS, Singapore IFIP TC14 Chair

Don Marinelli ETC CMU, USA

Organizing Chairs

Matthias Rauterberg Eindhoven University of Technology,

The Netherlands

Fumio Kishino Osaka University, Japan

Young Jik Lee ETRI, Korea

Program Chairs

Junichi Hoshino University of Tsukuba, Japan

Rainer Malaka University of Bremen, TZI, Germany

Jung Hyun Han Korea University, Korea

Media Art/Design Chairs

Naoko Tosa Kyoto University, Japan Oliver Grau Danube University, Austria

Workshop Chairs

Yoomi Choi Ewha University, Korea Dongho Kim Soongsil University, Korea

Exhibition Chair

Jiyoung Lee CMU ETC, USA

Program Committee

Lynne Baillie (United Kingdom), Ville-Veikko Mattila (Finland), Christoh Bartneck (The Netherlands), Kazunori Miyata (Japan), Hisham Bizri (USA), Hiroshi Mori (Japan), Anne Braun (Germany), Noriko Nagata (Japan), Tony Brooks (Denmark), Masayuki Nakajima (Japan), Pedro Gonzalez Calero (Spain), Atsushi Nakano (Japan), Marcello Carrozzino (Italy), Ryohei Nakatsu (Singapore), Marc Cavazza (United Kingdom), Stephane Natkin (France), Adrian David Cheok (Singapore), Anton Nijholt (The Netherlands), Sung Hyun Cho (Korea), Seiichi Nishihara (Japan), Yoo Mi Choi (Korea), Kazushi Nishimoto (Japan), Hyung IL Choi (Korea), David Obdrzalek (Czech Republic), Paolo Ciancarini (Italy), Kyu Whan Oh (Korea), Philippe Codognet (Japan), Hiroshi Okuno (Japan), Michael Cohen (Japan), Elina M.I. Ollila (Finland), Fionnuala Conway (Ireland), Tetsuo Ono (Japan), Nuno Correia (Portugal), Zhigeng Pan (China), Sidney Fels (Canada), Lucia Pannese (Italy), Newton Fernando (Singapore), Chang Joon Park (Korea), Brian Fisher (Canada), Jisoo Park (Korea), Sam Ge (Singapore), Jong-II Park (Korea), Nahum Gershon (USA), Lyn Pemberton (United Kingdom), James Gimzewski (USA), Yusuf Pisan (Australia), Jung Hyun Han (Korea), Cristina Portales (Spain), Stephen Hansen (Australia), Peter Purgathofer (Austria), Brenda Harger (USA), Matthias Rauterberg (The Netherlands), Jaap van den Herik (The Netherlands), Richard Reilly (Ireland), Junichi Hoshino (Japan), Zhong Ren (China), Xian-Sheng Hua (China), Marco Roccetti (Italy), Michita Imai (Japan), Maria Roussou (Greece), Masa Inakage (Japan), Ben Salem (The Netherlands), Takehiko Kamae (Japan), Huaqin Shen (China), Haruhiro Katayose (Japan), Akihiko Shirai (Japan), Hirokazu Katoh (Japan), Kazuto Shiratori (Japan), Gerald J Kim (Korea), Andy Sloane (Unite Kingdom), Laehyun Kim (Korea), Masanori Sugimoto (Japan), Dong Ho Kim (Korea), Yasuyuki Sumi (Japan), Yoshifumi Kitamura (Japan), Kaoru Sumi (Japan), Fusako Kusunoki (Japan), Barnabas Takacs (Hungary), Jong-Weon Lee (Korea), Hiroki Takahashi (Japan), Inkwon Lee (Korea), Tsutomu Terada (Japan), Joon Suk Lee (Korea), Masashi Toda (Japan), Chil Woo Lee (Korea), Naoko Tosa (Japan), Seungyon Lee (Korea), Sofia Tsekeridou (Greece), Ji Young Lee (USA), Lucia Vera (Spain), Soon Bum Lim (Korea), Roel Vertegaal (Canada), Duh Been Lim (Singapore), Victoria Vesna (USA), Artur Lugmayr (Finland), Yangsheng Wang (China), Luzhuang Ma (China), Kevin Wong (Australia), Rainer Malaka (Germany), Woontack Woo (Korea), Tony Manninen (Finland), Yasuyuki Yanagida (Japan), Donald Marinelli (USA), Xubo Yang (China), Panos Markopoulos (The Netherlands), Hyun Seung Yang (Korea), Marco A. Gomez Martin (Spain), Sung Eui Yoon (Korea), Javier Jaen Martinez (Spain), Radslav Yoshinov (Bulgaria), So Masuko (Japan), Ruwei Yun (china), Hitoshi Matsubara (Japan), Alexander Markowetz (Germany), Tim Marsh (Singapore)

Supporting Organizations

International

International Federation for Information Processing (IFIP) Institute of Electrical and Electronics Engineers (IEEE)

Association for Computing Machinery (ACM) Information Processing Society of Japan (IPS) The British Computer Society (BCS) Societe des electriciens et des electroniciens (SEE) Gesellschaft für Informatik e.V. (GI) Asia Digital Art and Design Association (ADADA)

Local

The Korean Institute of Information Scientists and Engineers (KIISE)
Korea Multimedia Society (KMMS)
Human Computer Interaction KOREA (HCI KOREA)
Korea Computer Graphics Society (KCGS)
Korea Game Society (KGS)
Electronics and Telecommunications Research Institute (ETRI)
KAIST Microsoft Research Collaboration Center (KMCC)

Table of Contents

Long Papers

New Interfaces and Entertainment Robots	
Baby Robot "YOTARO"	1
A Card Playing Humanoid for Understanding Socio-emotional Interaction	9
DreamThrower: Creating, Throwing and Catching Dreams for Collaborative Dream Sharing	20
Everyone Can Do Magic: An Interactive Game with Speech and Gesture Recognition	32
User Interfaces	
Onomatopen: Painting Using Onomatopoeia	43
Helping Hands: Designing Video Games with Interpersonal Touch Interaction	55
Investigating the Affective Quality of Motion in User Interfaces to Improve User Experience	67
Serious Games and Collaborative Interaction	
The MINWii Project: Renarcissization of Patients Suffering from Alzheimer's Disease Through Video Game-Based Music Therapy Samuel Benveniste, Pierre Jouvelot, and Renaud Péquignot	79
Virtual Team Performance Depends on Distributed Leadership	91

Nonverbal Behavior Observation: Collaborative Gaming Method for Prediction of Conflicts during Long-Term Missions	103
Engaging Autistic Children in Imitation and Turn-Taking Games with Multiagent System of Interactive Lighting Blocks	115
Tools and Networks	
Multiple Page Recognition and Tracking for Augmented Books	127
Online Scene Modeling for Interactive AR applications	139
Unnecessary Image Pair Detection for a Large Scale Reconstruction $\textit{Jaekwang Lee and Chang-Joon Park}$	151
Online Gaming Traffic Generator for Reproducing Gamer Behavior Kwangsik Shin, Jinhyuk Kim, Kangmin Sohn, Changjoon Park, and Sangbang Choi	160
Game Theory and User Studies	
Click or Strike: Realistic versus Standard Game Controls in Violent Video Games and Their Effects on Aggression	171
Logos, Pathos, and Entertainment	183
The Video Cube Puzzle: On Investigating Temporal Coordination Eric Yim, William Joseph Gaudet, and Sid Fels	193
Emotions: The Voice of the Unconscious	205
Short Papers	
Game Theory, User Studies and Story Telling	
Analyzing the Parameters of Prey-Predator Models for Simulation	01.0
Games	216

Table of Contents	XIII
Analyzing Computer Game Narratives	224
Cultural Computing – How Can Technology Contribute the Spiritual Aspect of Our Communication?	232
Interaction and User Experience	
System and Context – On a Discernable Source of Emergent Game Play and the Process-Oriented Method	240
Re-envisioning the Museum Experience: Combining New Technology with Social-Networking	248
Interactive Environments: A Multi-disciplinary Approach towards Developing Real-Time Performative Spaces	254
Explorations in Player Motivations: Virtual Agents	262
Serious Games	
Integration of CityGML and Collada for High-Quality Geographic Data Visualization on the PC and Xbox 360	270
Virtual Blowgun System for Breathing Movement Exercise	278
Development of a Virtual Electric Wheelchair – Simulation and Assessment of Physical Fidelity Using the Unreal Engine 3	286
Event-Based Data Collection Engine for Serious Games	294
Culturally Sensitive Computer Support for Creative Co-authorship of a Sex Education Game	302

Tools and Methods

Real-Time Caustics in Dynamic Scenes with Multiple Directional Lights	308
Budianto Tandianus, Henry Johan, and Hock Soon Seah	900
An Extraction Method of Lip Movement Images from Successive Image Frames in the Speech Activity Extraction Process	317
Rule-Based Camerawork Controller for Automatic Comic Generation from Game Log	326
A Framework for Constructing Entertainment Contents Using Flash and Wearable Sensors	334
Research on Eclipse Based Media Art Authoring Tool for the Media	
Artist	342
BAAP: A Behavioral Animation Authoring Platform for Emotion Driven 3D Virtual Characters	350
Choshi Design System from 2D Images	358
Player's Model: Criteria for a Gameplay Profile Measure	366
Robots and New Interfaces	
A Laban-Based Approach to Emotional Motion Rendering for Human-Robot Interaction	372
A Biofeedback Game with Physical Actions	381
Dial-Based Game Interface with Multi-modal Feedback	389
Tangible Interactive Art Using Marker Tracking in Front Projection Environment: The Face Cube	397

Table of Contents	XV
Entertaining Education: User Friendly Cutting Interface for Digital Textbooks	405
Posters	
Affective Interacting Art	413
Flexible Harmonic Temporal Structure for Modeling Musical Instrument	416
Towards a Service-Oriented Architecture for Interactive Ubiquitous Entertainment Systems	419
Narrative Entertainment System with Tabletop Interface	422
Automated Composing System for Sub-melody Using HMM: A Support System for Composing Music	425
A Study on the Development of Mobile Based SNS-UCC Writing Tool	428
Project Sonology: An Experimental Project Exploring the Possibilities of Sound and Audio as the Primary Element of Interactive Entertainment	431
Multipresence-Enabled Mobile Spatial Audio Interfaces	434
Fluxion: An Innovative Fluid Dynamics Game on Multi-touch Handheld Device	437
Robotic Event Extension Experience	440

Interactive Manipulation Model of Group of Individual Bodies for VR Cooking System	484
Smile Like Hollywood Star: Face Components as Game Input Jaewook Jung, Hanbit Park, Shin Kang, and Minsoo Hahn	487
Study on an Information Processing Model with Psychological Memory for a Kansei Robot	490
Vegetation Interaction Game: Digital SUGOROKU of Vegetation Succession for Children	493
Penmanship Learning Support System: Feature Extraction for Online Handwritten Characters	496
Development of Wall Amusements Utilizing Gesture Input	499
Study on an Emotion Generation Model for a Robot Using a Chaotic Neural Network	502
Interactive Tabu Search vs. Interactive Genetic Algorithm	505
Instant First-Person Posture Estimation	508
Monitoring User's Brain Activity for a Virtual Coach	511
Developing Educational and Entertaining Virtual Humans Using Elckerlyc	514
Author Index	519