

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

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

University of Dortmund, Germany

Madhu Sudan

Massachusetts Institute of Technology, MA, USA

Demetri Terzopoulos

University of California, Los Angeles, CA, USA

Doug Tygar

University of California, Berkeley, CA, USA

Moshe Y. Vardi

Rice University, Houston, TX, USA

Gerhard Weikum

Max-Planck Institute of Computer Science, Saarbruecken, Germany

Michael Lew Nicu Sebe Thomas S. Huang
Erwin M. Bakker (Eds.)

Human–Computer Interaction

IEEE International Workshop, HCI 2007
Rio de Janeiro, Brazil, October 20, 2007
Proceedings

Volume Editors

Michael Lew
Erwin M. Bakker
Leiden University
LIACS Media Lab
Niels Bohrweg 1, 2333 CA Leiden, The Netherlands
E-mail: {mlew, erwin}@liacs.nl

Nicu Sebe
University of Amsterdam
Faculty of Science
Kruislaan 403, 1098 SJ Amsterdam, The Netherlands
E-mail: nicu@science.uva.nl

Thomas S. Huang
University of Illinois at Urbana-Champaign
Beckman Institute for Advanced Science and Technology
405 North Mathews Avenue, Urbana, IL 61801, USA
E-mail: huang@ifp.uiuc.edu

Library of Congress Control Number: 2007937397

CR Subject Classification (1998): H.5, H.5.2, I.2.6, H.3, H.2.4

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

ISSN 0302-9743
ISBN-10 3-540-75772-4 Springer Berlin Heidelberg New York
ISBN-13 978-3-540-75772-6 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 is a part of Springer Science+Business Media
springer.com

© Springer-Verlag Berlin Heidelberg 2007
Printed in Germany

Typesetting: Camera-ready by author, data conversion by Scientific Publishing Services, Chennai, India
Printed on acid-free paper SPIN: 12176533 06/3180 5 4 3 2 1 0

Preface

Welcome to the 4th IEEE International Workshop on Human – Computer Interaction, HCI 2007. Human – computer interaction (HCI) is one of the foremost challenges of our society. New paradigms for interacting with computers are being developed that will define the 21st century and enable the world to communicate and interact effortlessly and intuitively.

The goal of this workshop is to bring together researchers whose work is related to human – computer interaction, share novel ideas, and stimulate new research directions. This year we received 113 submissions from more than 18 countries. Based upon the double-blind reviews of the program committee, 15 papers were accepted for oral presentation and publication in the proceedings.

We would like to thank all of the members of the Program Committee. Their reviews of the submissions as always played a pivotal role in the quality of the workshop. Furthermore, we would like to acknowledge our sponsors and supporters, the Leiden Institute of Advanced Computer Science at Leiden University, the Faculty of Science at the University of Amsterdam, the Beckman Institute at the University of Illinois at Urbana-Champaign, BSIK/BRICKS/FOCUS, the Netherlands National Science Foundation (NWO) and IEEE.

Finally, special thanks go to Bart Thomee, who met the myriad and unexpected challenges of organizing this workshop with generous and tireless dedication.

August 2007

Michael Lew
Nicu Sebe

IEEE International Workshop on Human – Computer Interaction 2007 Organization

Organizing Committee

General Co-chairs	Michael Lew (LIACS Media Lab, Leiden University, The Netherlands) Nicu Sebe (Faculty of Science, University of Amsterdam, The Netherlands)
Program Chair	Erwin M. Bakker (LIACS Media Lab, Leiden University, The Netherlands)
Executive Chair	Thomas S. Huang (Beckman Institute, University of Illinois at Urbana-Champaign, USA)

Program Committee

Kiyo Aizawa	University of Tokyo, Japan
Erwin M. Bakker	Leiden University, The Netherlands
Margrit Betke	Boston University, USA
Alberto del Bimbo	University of Florence, Italy
Edward Chang	Google Research, China
Jeffrey Cohn	University of Pittsburgh, USA
Daniel Gatica-Perez	IDIAP Research, Switzerland
Thomas Huang	Univ. of Illinois at Urbana-Champaign, USA
Alejandro Jaimes	IDIAP Research, Switzerland
Rana Kaliouby	MIT, USA
Ashish Kapoor	Microsoft Research, USA
Stefan Kopp	Univ. Bielefeld, Germany
Michael Lew	Leiden University, The Netherlands
Qiong Liu	FXPAL, USA
Maja Pantic	Imperial College, UK
Ioannis Patras	Queen Mary University, UK
Nicu Sebe	University of Amsterdam, The Netherlands
Peter Sun	Nanjing University, China
Qi Tian	University of Texas at San Antonio, USA
Matthew Turk	University of California, Santa Barbara, USA
Jordi Vitria	Universitat Autònoma de Barcelona, Spain
Guangyou Xu	Tsinghua University, China
Ming-Hsuan Yang	Honda Research Labs, USA
Xiang (Sean) Zhou	Siemens Research, USA

Sponsoring Institutions and Supporters

Leiden Institute of Advanced Computer Science, Leiden University,
The Netherlands

University of Amsterdam, The Netherlands

University of Illinois at Urbana-Champaign, USA

BSIK/BRICKS/FOCUS

Netherlands National Science Foundation (NWO)

IEEE

Table of Contents

Human-Computer Intelligent Interaction: A Survey	1
<i>Michael Lew, Erwin M. Bakker, Nicu Sebe, and Thomas S. Huang</i>	
Drowsy Driver Detection Through Facial Movement Analysis	6
<i>Esra Vural, Mujdat Cetin, Aytul Ercil, Gwen Littlewort, Marian Bartlett, and Javier Movellan</i>	
An Artificial Imagination for Interactive Search	19
<i>Bart Thomee, Mark J. Huiskes, Erwin M. Bakker, and Michael Lew</i>	
Non-intrusive Physiological Monitoring for Automated Stress Detection in Human-Computer Interaction	29
<i>Armando Barreto, Jing Zhai, and Malek Adjouadi</i>	
PEYE: Toward a Visual Motion Based Perceptual Interface for Mobile Devices	39
<i>Gang Hua, Ting-Yi Yang, and Srinath Vasireddy</i>	
Vision-Based Projected Tabletop Interface for Finger Interactions	49
<i>Peng Song, Stefan Winkler, Syed Omer Gilani, and ZhiYing Zhou</i>	
A System for Hybrid Vision- and Sound-Based Interaction with Distal and Proximal Targets on Wall-Sized, High-Resolution Tiled Displays . . .	59
<i>Daniel Stødle, John Markus Bjørndalen, and Otto J. Anshus</i>	
Real-Time Automatic Kinematic Model Building for Optical Motion Capture Using a Markov Random Field	69
<i>Stjepan Rajko and Gang Qian</i>	
Interactive Feedback for Video Tracking Using a Hybrid Maximum Likelihood Similarity Measure	79
<i>Ard Oerlemans and Bart Thomee</i>	
Large Lexicon Detection of Sign Language	88
<i>Helen Cooper and Richard Bowden</i>	
Nonparametric Modelling and Tracking with <i>Active-GNG</i>	98
<i>Anastassia Angelopoulou, Alexandra Psarrou, Gaurav Gupta, and José García-Rodríguez</i>	
Multiple Cue Integrated Action Detection	108
<i>Sang-Hack Jung, Yanlin Guo, Harpreet Sawhney, and Rakesh Kumar</i>	
Combined Support Vector Machines and Hidden Markov Models for Modeling Facial Action Temporal Dynamics	118
<i>Michel F. Valstar and Maja Pantic</i>	

Pose and Gaze Estimation in Multi-camera Networks for Non-restrictive HCI	128
<i>Chung-Ching Chang, Chen Wu, and Hamid Aghajan</i>	
Exact Eye Contact with Virtual Humans.....	138
<i>Andrei State</i>	
Real Time Body Pose Tracking in an Immersive Training Environment	146
<i>Chi-Wei Chu and Ramakant Nevatia</i>	
Author Index	157