Proceedings

The Fourth International Conference on Creating, Connecting and Collaborating through Computing

26-27 January, 2006 University of California, Berkeley, California USA

Edited by

Hajime Kita Kim Rose Benay Dara-Abrams Rieko Kadobayashi Rick McGeer Hideyuki Takada

Organized by

Center for Information Technology Research in the Interest of Society,
University of California, Berkeley
Hewlett-Packard Company
Kyoto University 21st Century Center of Excellence (COE) Program:
Development of Knowledge Society Infrastructure
National Institute of Information and Communications Technology
Viewpoints Research Institute



Los Alamitos, California

Washington • Brussels • Tokyo

Copyright © 2006 by The Institute of Electrical and Electronics Engineers, Inc. All rights reserved.

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries may photocopy beyond the limits of US copyright law, for private use of patrons, those articles in this volume that carry a code at the bottom of the first page, provided that the per-copy fee indicated in the code is paid through the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

Other copying, reprint, or republication requests should be addressed to: IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, P.O. Box 133, Piscataway, NJ 08855-1331.

The papers in this book comprise the proceedings of the meeting mentioned on the cover and title page. They reflect the authors' opinions and, in the interests of timely dissemination, are published as presented and without change. Their inclusion in this publication does not necessarily constitute endorsement by the editors, the IEEE Computer Society, or the Institute of Electrical and Electronics Engineers, Inc.

IEEE Computer Society Order Number P2563 ISBN 0-7695-2563-6 ISBN 978-0-7695-2563-1 Library of Congress Number 2006921099

Additional copies may be ordered from:

IEEE Computer Society Customer Service Center 10662 Los Vaqueros Circle P.O. Box 3014 Los Alamitos, CA 90720-1314 Tel: + 1 800 272 6657 Fax: + 1 714 821 4641

Fax: + 1 714 821 4641 http://computer.org/cspress csbooks@computer.org IEEE Service Center
445 Hoes Lane
P.O. Box 1331
Piscataway, NJ 08855-1331
Tel: + 1 732 981 0060
Fax: + 1 732 981 9667
http://shop.ieee.org/store/customer-service@ieee.org

IEEE Computer Society
Asia/Pacific Office
Watanabe Bldg., 1-4-2
Minami-Aoyama
Minato-ku, Tokyo 107-0062
JAPAN
Tel: +81 3 3408 3118
Fax: +81 3 3408 3553
tokyo.ofc@computer.org

Individual paper REPRINTS may be ordered at: reprints@computer.org

Editorial production by Bob Werner

Cover art production by Joe Daigle/Studio Productions

Printed in the United States of America by Applied Digital Imaging





IEEE Computer Society

Conference Publishing Services

http://www.computer.org/proceedings/

Table of Contents

The Fourth International Conference on Creating, Connecting and Collaborating through Computing (C5 2006)	
Preface	viii
Conference Organization	ix
Keynote Talks	x
Content Generation, Annotation and Search for Croquet Environment	
Croquet with TVML: Scripting and Generating Croquet 3D Worlds Using TVML Yutaka Kidawara, Takashi Yamamiya, Masaki Hayashi, and Katsumi Tanaka	2
3D Model Annotation from Multiple Viewpoints for Croquet Rieko Kadobayashi, Julian Lombardi, Mark P. McCahill, Howard Stearns, Katsumi Tanaka, and Alan Kay	10
Reconfigurable Search Engine for Exploiting Search Knowledge	16
Media for Collaboration (1)	
3D Environments Utilization Effects in Development Processes of Embedded IT Devices	26
Basket—An Experimental Email Environment for Sharing Objects	29
Collaborative Peer-Based Language Learning in Unsupervised Asynchronous Online Environments Goh Kawai	35
Learning Environments	
What Does Squeak Provide Students with?—A Comparative Study of Squeak eToy and Excel VBA as Tools for Problem-Solving Learning in High School	42
Computer-Aided Collaboration Environment for Long-Term Cross-Cultural Studies between Korean and Japanese High Schools	50
Learning in a Distance and Collaborative Course that Connected Kyoto University and UCLA	58
New Directions for Croquet (1)	
Extending Croquet Spaces with Vector Fields, Vehicles, and Virtual Presence	68
Jam Tomorrow: Collaborative Music Generation in Croquet Using OpenAL	73

Deconstruction in Collaborative Croquet Spaces Howard Stearns, Joshua Gargus, Martin Schuetze, and Julian Lombardi	79
Media for Collaboration (2)	
Object Deputy Database Language	88
Emotional Agents for Interactive Environments Maic Masuch, Knut Hartman, and Grit Schuster	96
Proposing an Interactive Collaboration Media in P2P Settings Hiromu Araie, Masaki Hirokawa, Ryo Nishide, and Shinichi Ueshima	103
Collaborative Environments (1)	
The Global Computer	112
New Collaborative Tools	120
3D Global Virtual Teaming Environment	126
New Directions for Croquet (2)	
A Language Supporting Direct Manipulation of Component-Based Object Construction and Deconstruction in Collaborative Croquet Spaces Howard Stearns, Joshua Gargus, Martin Schuetze, and Julian Lombardi	136
Croquet? on Mars	142
Wouldn't You Like to Have Your Own Studio in Croquet? Costanze Langer, Andreas Raab, Christine Strothotte, and Carola Zwick	150
Network Environments for Collaboration	
Authorization-Based Access Control for the Services Oriented Architecture Alan H. Karp	160
Scalability of Collaborative Environments	168
System LSI Distributed Collaborative Design Environment for Both Designers and CAD Developers/Engineers	175

Collaborative Environments (2)

Autonomous Generation of Spherical P2P Delaunay Network for Global Internet Applications Hiroaki Kato, Takayuki Eguchi, Masaaki Ohnishi, and Shinichi Ueshima	184
EXEC: An Evolvable and eXtensible Environment for Collaboration	192
Inheriting Traditional Concept of "Turn" in Electronic Brain Writing for Group Idea Generation	200
Creation Support	
Semantics and Performance Considerations of Kedama, A GUI-Based Massively Parallel Programming Language	210
Script Synthesis Tool for Non-Experienced Programmers	218
Idioms for Composing Games with EToys	222
Simulation	
An XML-Based Microworld Simulator for Business Modeling Education	232
User Evaluation of Information Presentation System for Nature Observation	240
SABER—Simulator for Agent Based Educational Architecture Akira Sasaki, Ko Ishiyama, and Hiroshi Deguchi	246
Collaborative Environments (3)	
An Integrated Session and Repository Management Approach for Real-Time Collaborative Editing Systems Steven Xia, David Sun, Chengzheng Sun, and David Chen	254
A Buffer Framework for Supporting Responsive Interaction in Information Visualization Interfaces	262
LogCabin: A Tool for Workshop Documentation and Visualization	270
Demos and Posters Session	
Abstracts of Pre-Registered Demos and Posters	
Author Index	277