PDC'94: Proceedings of the Participatory Design Conference

Chapel Hill, North Carolina, USA 27-28 October, 1994

Editors:

Randall Trigg
Xerox Palo Alto Research
Center
Palo Alto, CA USA

Susan Irwin Anderson Xerox Corporate Research & Technology Rochester, NY USA Elizabeth Dykstra-Erickson Apple Computer, Inc. Cupertino, CA USA

PDC'94 is sponsored by Computer Professionals for Social Responsibility, and is in cooperation with ACM SIGCHI.





©Copyright 1994 Computer Professionals for Social Responsibility. All rights reserved.

Computer Professionals for Social Responsibility
P.O. Box 717
Palo Alto, CA 94302-0717 USA
+1 (415) 322-3778 (voice)
+1 (415) 322-4748 (fax)
cpsr@cpsr.org

Cover design by Pat Coleman, Apple Computer, Inc.

Table of Contents

| Welcome to PDC'94vii |
|--|
| PDC'94 Technical Program Committeeix |
| Conference Committeex |
| Computer Professionals for Social Responsibilityxi |
| Opening Keynote From subversion to hype: On political and technical agendas in PD |
| Paper Session I: Scandinavian Participatory Design: From trade unions to organizations |
| User participation: A strategy for work life democracy? |
| Creating conditions for participation: Conflicts and resources in systems design 13 Susanne Bødker, Department of Computer Science, Aarhus University, Århus, Denmark |
| Participatory analysis of flexibility: Some experiences |
| Panel Session I: Does Participatory Design have a role in software package development? |
| Moderator: Erran Carmel, The American University, Washington DC USA Jonathan Grudin, School of Management, University of California, Irvine, California USA |
| Dianne Juhl, Microsoft Usability Group, Microsoft, Redmond, Washington USA Tom Erickson, User Experience Architect's Office, Apple Computer, Inc., Cupertino, California USA |
| Jamie Robbins, SAS Institute, Cary, North Carolina USA |
| Paper Session II: Power relations: Structures and dynamics |
| Systems as intermediaries: Political frameworks of design and participation |

| Take users seriously, but take a deeper look: Organizational and technical effects from designing with an ethnographically inspired approach | 7 |
|--|---|
| Dilemmas in cooperative design | 9 |
| Paper/Panel Session II: Participatory Design Education | |
| On participatory design and user involvement as topics in computing education: A contribution to a curriculum debate | 7 |
| Panel: Teaching participatory design | 3 |
| Paper Session III: Designers meeting users: Conversations and representations | |
| Voices in Design: The dynamics of participatory information system design | 5 |
| Representations of work: Bringing designers and users together | 7 |
| Reflections on a work-oriented design project | 9 |
| Panel Session III: Participatory Design in complex organizations11 | 1 |
| Moderator: Patricia Sachs, NYNEX Science & Technology, White Plains, New York USA Marsha Ellis, NYNEX Science & Technology, White Plains, New York USA Brigitte Jordan, Xerox PARC and IRL, Palo Alto, California USA Riitta Helmann, Norwegian Computing Center, Oslo, Norway | |
| Evening Keynote When 'old' and 'new' technologies have to interact and co-exist | 3 |

| Ar | tifacts Session |
|----|--|
| | Artifacts program |
| | The wall: An artifact of design, development, and history |
| | Using video-based interaction analysis in the workplace |
| | Working time lab: Supporting participative design of the organizational planning of shift models |
| | Updating a taxonomy of participatory practices: A participatory poster |
| | Participatory development of a consumer product |
| | Boundary spanning roles in the design process |
| | Participatory design of end-user programming tools in a micro world |
| | Bringing users into the discussion of an unfamiliar technology |
| | MOI-tool: A HyperCard-based tool for creating demonstrations of cooperative systems |
| Pa | rallel Workshops |
| | The Work Mapping technique |

| | Constructing a framework for participatory work systems design: A workshop for |
|----|--|
| | Albert M. Selvin, Maarten Sierhuis, and Angelika Kindermann, NYNEX Science & Technology, Inc., White Plains, New York USA |
| | Science & Technology, Inc., White Plains, New York USA Rob van der Spek, Center for Knowledge Technology, Utrecht, The Netherlands |
| | Education for participatory design |
| | Tone Bratteteig, Department of Informatics, University of Oslo, Oslo, Norway David Hakken, Institute of Technology, State University of New York, Uttica, New York USA |
| | Michael Muller, U S WEST Technologies, Boulder, Colorado USA Karlheinz Kautz and Kari Thoreson, Norwegian Computing Center, Oslo, Norway |
| | Velcro®-modeling and projective expression: Participatory design methods for |
| | product development |
| | The role of representations in distributed design — The social and technical organization |
| | Werner Beuschel, Department of Business Informatics, Fachhochschule Brandenburg, Brandenburg FRG |
| | Susanne Bødker, Department of Computer Science, University of Aarhus, Århus, Denmark |
| | Reinhard Keil-Slawik, Heinz Nixdorf Institute, University of Paderborn, Paderborn, FRG |
| | Scott Minneman, Xerox PARC, Palo Alto, California USA |
| | Meeting of the minds: The challenges of interdisciplinary and inter-occupational communication |
| | Sarah Kuhn, Policy and Planning Department, University of Massachusetts, Lowell, Massachusetts USA |
| | Charles Richardson, Technology and Work Program, University of Massachusetts, Lowell, Massachusetts USA |
| | Marian G. Williams, Center for Productivity Enhancement, University of Massachusetts, Lowell, Massachusetts USA |
| | Video-based interaction analysis in the workplace: A tool for workers' appropriation of their own practice |
| | ation of their own practice |
| Pa | per Session IV: Lessons from the Field: Three case studies |
| | HIV and AIDS awareness and education poster project: A study in participatory |
| | graphic design |

| Enabling schoolteachers to participate in the design of educational software |
|--|
| Specific cooperative analysis and design in general hypermedia development159 Kaj Grønbæk and Preben Mogensen, Department of Computer Science, Aarhus University, Århus, Denmark |
| Panel Session IV: The Limits of PD? Contingent jobs and work reorganization173 |
| Moderator: Joan Greenbaum, LaGuardia Community College, City University of New York, New York, New York USA Leigh Snelling, Union Research Centre on Organisation and Technology Limited, Melbourne, Victoria, Australia Cath Jolly, Australian Taxation Office and Public Sector Union, Moonee Ponds, Victoria, Australia Julian Orr, Xerox Palo Alto Research Center, Palo Alto, California USA |
| Closing Discussion: PD: Politics and Prospects |
| Moderator: Andrew Clement, Faculty of Information Sciences, University of Toronto, Toronto, Canada Speaker: David Nobel, Division of Social Sciences, York University, Canada Diana Roose, 9to5, National Association of Working Women, Cleveland, Ohio, USA Morten Kyng, Department of Computer Science, Aarhus University, Århus, Denmark Björg Aase Sørensen, Work Research Institute, Oslo, Norway |
| Democracy Wall '94: If you get any closer, introduce yourself |
| Author Index179 |
| Keyword Index181 |
| CPSR Membership Form183 |

WELCOME TO PDC '94

The Conference on Participatory Design provides a continuing forum for discussing and promoting user participation in the design of systems, both organizational and computer-based. The first Participatory Design conference explored the historical roots of this way of working, by bringing European practitioners together with American researchers and industry developers. By the second conference, PDC'92, participatory approaches to design had taken root in the US, not only in research environments, but also at several commercial firms. Both conferences included practical workshops where attendees could learn about techniques developed to support and encourage participation in various aspects of design. One theme that emerged from the papers and sessions of PDC'92 was the crucial role played by organizational issues — politics, culture, memory and learning — in design.

PDC'94 picks up this theme with papers, panels, and plenaries covering politics, organizations, education, and field studies. As in the previous two conferences, we're featuring a half day of parallel workshops covering practical aspects of user involvement in technology design and development. For the first time this year, we're offering a forum for the presentation of artifacts — representations, techniques, methods, and technologies developed for or through participatory design. We are excited by the program and by the opportunity these two days provide for conversation, discourse, and interaction among all participants. We look forward to participating.

Finally, we wish to thank the many people who have made this conference possible. The members of the conference and program committees, listed on the next page, gave generously of their time to insure that the conference came together. Special mention is due Barbara Katzenberg for publicity work and Susan Suchman Simone for early work on local arrangements. Andrea Mosher led the design of the program flyer and conference logo. Mimi Gardner's assistance was crucial for the work of the program committee. The proceedings were produced by Elizabeth Dykstra-Erickson and Pat Coleman. Computer Professionals for Social Responsibility, the main sponsor for this conference, deserves special thanks, particularly Nikki Draper, Kathleen Kells, Susan Evoy and Al Whaley.

This promises to be a wonderful opportunity to meet and talk about our shared interests, our accomplishments and our concerns. We hope you enjoy it,

Bill Anderson, Susan Anderson, and Randy Trigg

PDC'94 Technical Program Committee

- Annette Adler, Xerox Systems Architecture, Palo Alto, California, USA
- Susan Irwin Anderson, Xerox Corporate Research & Technology, Rochester, New York, USA
- Susanne Bødker, Aarhus University, Denmark
- Tone Bratteteig, University of Oslo, Norway
- Andrew Clement, University of Toronto, Canada
- Yrjö Engeström, University of California, San Diego, California, USA
- Christiane Floyd, University of Hamburg, Germany
- Joan Greenbaum, LaGuardia College, City University of New York, New York, USA
- Judith Gregory, University of California, San Diego, California, USA
- Kaj Grønbæk, Aarhus University, Denmark
- Jonathan Grudin, University of California, Irvine, California, USA

- Mike Hales, University of Brighton, UK
- Karen Holtzblatt, InContext Enterprises, Sudbury, Massachusetts, USA
- Finn Kensing, Roskilde University, Roskilde, Denmark
- Sarah Kuhn, University of Massachusetts, Lowell, Massachusetts, USA
- Michael Muller, US WEST Technologies, Boulder, Colorado, USA
- Patricia Sachs, NYNEX Science and Technology, White Plains, New York, USA
- Randall Trigg, Xerox Palo Alto Research Center, Palo Alto, California, USA
- Eline Vedel, The National Bank of Norway, Oslo, Norway
- Ina Wagner, Technical University, Vienna, Austria
- Terry Winograd, Stanford University / Interval Research, Stanford, California, USA

Artifacts Reviewers:

- Tom Dayton, Bellcore, Piscataway, New Jersey, USA
- Margaret B.W. Graham, Xerox PARC, Palo Alto, California, USA
- Elizabeth Bauer-Nilsen Sanders, Fitch, Worthington, Ohio, USA
- Ellen A. White, Bellcore, Piscataway, New Jersey, USA

Conference Committee

Conference Chair: William L. Anderson

Xerox Document Solutions Center, Rochester, New York, USA

Local Co-Chairs: Susan Suchman Simone

North Carolina State University, Raleigh, North Carolina, USA

David Bellin

NC A&T State University, Greensboro, North Carolina, USA

Program Co-Chairs: Susan Irwin Anderson

Xerox Corporate Research & Technology, Rochester, New York, USA

Randall Trigg

Xerox Palo Alto Research Center, Palo Alto, California, USA

Panels Chair: Andrew Clement

University of Toronto, Canada

Workshops Chair: Finn Kensing

Roskilde University, Roskilde, Denmark

Artifacts Co-Chairs: Annette Adler

Xerox Systems Architecture, Palo Alto, California, USA

Michael Muller

US WEST Technologies, Boulder CO, USA

Proceedings Chair: Elizabeth Dykstra-Erickson

Apple Computer, Inc., Cupertino, California, USA

Treasurer: Erran Carmel

The American University, Washington, D.C., USA

Publicity Co-Chairs: Barbara Katzenberg

Katzenberg Consulting, Brighton, Massachusetts, USA

Peter Piela

Aspen Technology, Cambridge, Massachusetts, USA

Computer Professionals for Social Responsibility

Computer Professionals for Social Responsibility is a national, non-partisan, public-interest organization dedicated to understanding and directing the role of computing in society. Decisions regarding the use of this technology have far-reaching consequences that reflect particular values and priorities. The mission of CPSR is to provide the public and policy makers with realistic assessments of the power, promise, and problems of information technology.

Founded in 1981 by a group of researchers concerned about the use of computers in nuclear weapons systems, CPSR has grown into a national public-interest alliance of information technology professionals and other people. Currently, CPSR has 1800 members, 22 chapters in the US, and contacts with similar groups worldwide. CPSR recently published the influential report "Serving the Community" on policy issues in the National Information Infrastructure, and is an active participant in the Telecommunications Policy Roundtable in Washington.

We believe that as the influence of computers continues to permeate every aspect of our society, it is important that professionals become active participants in formulating the policy that governs computer use and access. CPSR welcomes everyone who uses or is concerned about the role of information technology in our society.

CURRENT CPSR PROJECTS

By sponsoring both national and local projects, CPSR serves as a catalyst for in-depth discussion and effective action in key areas:

- The National Information Infrastructure
- · Civil Liberties and Privacy
- Computers in the Workplace
- Technology Policy and Human Needs
- Reliability and Risk of Computer-Based Systems

In addition, CPSR's chapter-based projects and national working groups tackle issues ranging from the implementation of Calling Number ID systems to the development of nanotechnology and virtual reality, from the use of computers in education to working conditions for computer profes-

sionals, from community networks to computer ethics.

HISTORICAL HIGHLIGHTS

- CPSR published the first papers and held the first public debates on the computing aspects of the Strategic Defense Initiative, or "Star Wars."
- CPSR members testified before a US Senate subcommittee on the feasibility of SDI.
- CPSR/Boston produced an award winning slide show and videotape called "Reliability and Risk: Computers and Nuclear War."
- CPSR members produced the first book for general audiences on the ways in which computers revolutionize modem weapons systems, Computers in Battle: Will they Work?
- At the request of a House subcommittee, CPSR studied the FBI's proposed National Crime Information Center upgrade (NCIC 2000). CPSR's report was widely credited for the FBI's subsequent decision to drop a proposal to track individuals who had not been charged with any crime.
- CPSR co-produced a "Special Report on Computers and Elections" for the 1988 Presidential Campaign, highlighting the potential for errors in electronic vote-counting systems.
- CPSR filed lawsuits under the Freedom of Information Act to force the FBI and Secret Service to reveal whether they monitor computer bulletin boards and electronic mail.
- CPSR/Portland hosted a conference on Computers and the Environment.
- The CPSR Workplace Project organized PDC'90 the first U.S. conference on participatory design, in which users work together with software designers to ensure that systems meet workers' needs.
- CPSR helped lead a successful grassroots campaign to convince the Lotus Development Corporation not to release their proposed Marketplace: Households product, which would have included data on 120 million Americans.
- CPSR/Berkeley organized a media campaign to register our concern over the deadly role of computing technology in the Persian Gulf War.

HOW TO BECOME A MEMBER

Just fill out the membership form attached as the last page of this volume, enclose a check, and mail it to CPSR, P.O. Box 717, Palo Alto, CA 94302.

MEMBERSHIP BENEFITS INCLUDE:

As a member of CPSR, you are joining a nationwide network of concerned people who are committed to bringing a public interest perspective to all aspects of information technology.

- Access to an international network of people who can provide expertise and well-researched support for progressive positions concerning information technology policy.
- Access to on-line information and discussion groups on key topics concerning the socially responsible use of information technology.
- The chance to participate in local and national work groups on issues of particular interest to you.
- A quarterly newsletter containing in-depth analysis of major issues as well as updates on CPSR activities and action alerts.
- Invitations and discounts to CPSR events and publications. CPSR sponsors conferences on Participatory Design (PDC), Directions and Implications of Advanced Computing (DIAC), and Computers, Freedom and Privacy (CFP), among others.

PRIVACY NOTICE

The CPSR membership database is never sold, rented, lent, exchanged, or used for anything other than official CPSR activity. CPSR may elect to send members mailings with information from other groups, but the mailings will always originate with CPSR.

JOIN CPSR'S ELECTRONIC MAILING LISTS

Placing yourself on CPSR's list server gives you access to a library of materials dealing with CPSR issues and CPSR documents. It is accessible via Internet and anyone can join. To subscribe, send email to:

listserv@cpsr.org

Your message needs to contain only one line:

SUBSCRIBE CPSR-ANNOUNCE <your first name><your last name>

You will get a return message that confirms your subscription. The message also explains how to use the list server to request materials and how to use the index of CPSR's archives.

If you have a problem with the list server, please contact

ftp-admin@cpsr.org

CPSR also maintains a number of email lists that focus on various issues and projects. To find out what email lists are available and how to join them, send an email containing the message LIST to listserv@cpsr.org

You can also request assistance by using the HELP command. If you have trouble contact ftp-admin@cpsr.org

ORGANIZATIONAL INFORMATION

CPSR National Office P.O. Box 717 Palo Alto, CA 94301 415-322-3778 415-322-4748 (FAX) E-mail: cpsr@cpsr.org

STAFF

Kathleen Kells Managing Director
Susan Evoy Database/Office Manager

BOARD OF DIRECTORS

Eric Roberts President
Doug Schuler Chair
Steve Dever Secretary
Judi Clark Treasurer

Steve Miller Director-at-Large Marsha Woodbury Director-at-Large

Blaise Liffick
James Davis
Hans K. Klein
Aki Namioka
Jim Grant
Middle Atlantic Director
Midwestern Director
New England Director
Northwestern Director
Southern Director
Western Director

David Liddle Special Director Terry Winograd Special Director

NATIONAL ADVISORY BOARD

Herbert L. Abrams John Backus Paul Brest David Burnham Carol Edwards Douglas Engelbart Admiral Noel Gayler Adele Goldberg Richard Karp Barbara Liskov James Martin Elliot Maxwell Eli Noam Karen Nussbaum Anthony Ralston John Shattuck Herbert Simon Robert E Tarjan Robert W. Taylor Lawrence Tesler Sherry Turkle

Keynote speaker:

From subversion to hype: On political and technical agendas in PD

Morten Kyng
Department of Computer Science
Aarhus University
Århus, Denmark
E-mail: mkyng@daimi.aau.dk

Over the last decades involvement of users in relation to system development has changed dramatically. Twenty years ago users entered the process at the end of the day, when the system was to be installed, and the 'users-to-be' thus needed to be instructed on how to use the new system. These days Microsoft wants end-users involved early in their design efforts -- not managers, and not IS people. Nokia develops and evaluates remote controls by studying television users in their homes and by means of mock-ups. Lotus and IBM do usability testing 'up-front' based on paper mock-ups of the interface. And Microsoft tells us that they base their design work on a Hegelian notion of conflict.

But what about the basic assumptions concerning this role -- the conditions for influence? Here much less has happened -- in some respects it seems that the political agenda of democratic oriented PD work hasn't progressed at all. Users are basically brought into the process because this makes it easier to develop profitable systems. They are not viewed as possibly influencing the overall requirements, but rather as contributing to meeting the goals set up by others.

The talk discusses such changes in user involvement and more broadly, changes in societal conditions for various types of PD. It considers past and present Scandinavian experiences in PD, positive as well as negative, and takes a look at the future of 'democratic PD'.

Morten Kyng is a member of the System Development Group at Aarhus University. Since the mid-seventies, the group has worked on a variety of projects in participatory design. The DUE project (1975-1979) had the goal of increasing worker influence on design and use of computer systems. The main focus was on development of local group-based work practices. The project was carried out together with local unions at three different companies and supported by the Danish TUC. The Scandinavian Utopia project (1980-1984) supplemented the local, factory level strategy with a central, trade union based effort to develop alternative computer support, support that could enhance the quality of work and products. For the last decade the main emphasis of the group has been on tools and techniques for participatory design. The current Devise project focuses on the development of computer-based tools, with the aim of making tools and techniques that support -- instead of obstruct -- worker influence in design.

In PDC'94: Proceedings of the Participatory Design Conference. R. Trigg, S.I. Anderson, and E.A. Dykstra-Erickson (Eds.). Chapel Hill NC USA, 27-28 October 1994. Computer Professionals for Social Responsibility, P.O. Box 717, Palo Alto CA 94302-0717 USA, cpsr@cpsr.org.