Murray Reed Little
Laurence Nigay (Eds.)

Engineering for Human-Computer Interaction

LNCS 2254

8th IFIP International Conference, EHCI 2001
Toronto, Canada, May 2001
Revised Papers

ASSOCIATION FOR
COMPUTING MACHINERY

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IFIP

TP11-53
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2001

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Revised Papers


E200402009

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Murray Reed Little
Carnegie Mellon University, Software Engineering Institute
Pittsburgh, PA 15213, USA
E-mail: little@sei.cmu.edu

Laurence Nigay
University of Grenoble 1, Laboratory CLIPS-IMAG, IIHM Research Group
385, rue de la Bibliothèque, 38041 Grenoble Cedex 9, France
E-mail: Laurence.Nigay@imag.fr

Cataloging-in-Publication Data applied for

Die Deutsche Bibliothek - CIP-Einheitsaufnahme

Engineering for human computer interaction : 8th IFIP international conference ; revised papers / EHCI 2001, Toronto, Canada, May 11 - 13, 2001. Murray Reed Little ; Laurence Nigay (ed.). - Berlin ; Heidelberg ; New York ; Barcelona ; Hong Kong ; London ; Milan ; Paris ; Tokyo : Springer, 2001
(Lecture notes in computer science ; Vol. 2254)
ISBN 3-540-43044-X

CR Subject Classification (1998): H.5.2, H.5.3, D.2, H.3, H.4, K.4

ISSN 0302-9743
ISBN 3-540-43044-X Springer-Verlag Berlin Heidelberg New York

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Printed in Germany

Typesetting: Camera-ready by author, data conversion by Steingräber Satztechnik GmbH, Heidelberg
Printed on acid-free paper SPIN: 10846000 06/3142 5 4 3 2 1 0

Lecture Notes in Computer Science 2254
Edited by G. Goos, J. Hartmanis, and J. van Leeuwen

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Preface

The papers collected here are those selected for presentation at the Eighth IFIP Conference on Engineering for Human-Computer Interaction (EHCI 2001) held in Toronto, Canada in May 2001.

The conference is organized by the International Federation of Information Processing (IFIP) Working Group 2.7 (13.4) for Interface User Engineering, Rick Kazman being the conference chair, Nicholas Graham and Philippe Palanque being the chairs of the program committee. The conference was co-located with ICSE 2001 and co-sponsored by ACM.

The aim of the IFIP working group is to investigate the nature, concepts, and construction of user interfaces for software systems. The group's scope is:

- to develop user interfaces based on knowledge of system and user behavior;
- to develop frameworks for reasoning about interactive systems; and
- to develop engineering models for user interfaces.

Every three years, the working group holds a working conference. The Seventh one was held September 14-18 1998 in Heraklion, Greece. This year, we innovated by organizing a regular conference held over three days.

Over 50 submitted papers were received, and each of them was reviewed by three WG 2.7 (13.4) members and observers. Twenty-one long papers and four short papers were selected for presentation at the conference. Their authors come from 10 countries, in North America and Europe, reflecting the truly international nature of the conference. The papers are organized into topic areas as follows:

- Software Engineering Methods
- Formal Methods
- Toolkits
- User Interface Evaluation
- User Interface plasticity
- 3D User Interfaces
- Input and Output Devices
- Mobile Interaction
- Context Sensitive Interaction

Following each presentation there was a discussion among the participants and the presenter. A transcript of the discussion is found at the end of each paper in these proceedings. Each session was assigned a discussion transcriber, whose responsibility was to collect/transcribe the questions and answers during the session. The original transcripts were distributed to the attendees during the conference, and modifications that clarified the discussion were accepted.

The program committee invited three keynote speakers, David Garlan, Saul Greenberg, and Jeff Raskin. Summaries of their talks are included in these proceedings.

Without the submission of papers, a conference cannot occur. IFIP WG 2.7 (13.4) thanks all those who spent energy and time in writing their papers and preparing their presentations.

July 2001 Reed Little and Laurence Nigay

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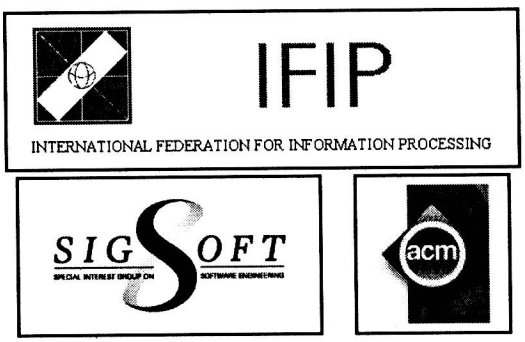

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User Interface Evaluation

User Interface Plasticity

3D User Interfaces

Input and Output Devices

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Context Sensitive Interaction

Aura: Distraction-Free Ubiquitous Computing

David Garlan

School of Computer Science
Carnegie Mellon University
5000 Forbes Avenue
Pittsburgh, PA 15213
garlan@cs.cmu.edu

Technological trends are leading to a world in which computing is all around us – in our cars, our kitchens, our offices, our phones, and even our clothes. In this world we can expect to see an explosion of computational devices, services, and information at our disposal. While this is an undeniable opportunity, currently we are ill-prepared to deal with its implications.

To take a simple example: Today I can easily afford to have 10 PCs in my office. But what can I do with them? Simply keeping them synchronized would be a nightmare. There are few, if any, applications that can exploit them simultaneously. And even if I could harness them all at once, the effort of configuring all of that software, ensuring version compatibility, starting it up, and stopping it in a consistent fashion would be painful. Furthermore, that equipment would not be usable by me in all of the other settings away from my office. Put simply, there is a serious mismatch between the availability of computing resources and our ability to exploit them effectively.

The root of the problem is that the most precious resource in a computer system is no longer its processor, memory, disk or network. Rather, it is a resource not subject to Moore's law: user attention. Today's systems distract a user in many explicit and implicit ways, thereby reducing his effectiveness. Unless we find ways to make technology more "invisible" we will see a widening gap between technological capability and usefulness.

At CMU we are addressing this problem in a new research effort called Project Aura. Aura's goal is to provide each user with an invisible halo of computing and information services that persists regardless of location, and that spans wearable, handheld, desktop, and infrastructure computers. As the user moves from one location to another, and as resources come and go, the system adapts, providing the user with continuous, self-configuring, optimal access to data and computation.

To achieve this goal, Project Aura is attempting to rethink system design, focusing on integrating two broad concepts across all system levels. First, it uses proactivity, or the ability of a system layer to act in anticipation of requests by a higher layer. This is in contrast to today's systems, where each layer is reactive to the layer above it. Second, Aura is self-tuning: layers adapt by observing the demands made on them and adjusting their performance and resource usage characteristics to match demand. This is in contrast to today's systems, where the behavior of a system layer is relatively static.

M. Reed Little and L. Nigay (Eds.): EHCI 2001, LNCS 2254, p. 1, 2001.
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Supporting Casual Interaction Between Intimate Collaborators

Saul Greenberg

Department of Computer Science, University of Calgary
Calgary, Alberta, CANADA T2N 1N4
saul@cpsc.ucalgary.ca

Over last decade, we have seen mounting interest in how groupware technology can support electronic interaction between intimate collaborators who are separated by time and distance. By intimate collaborators I mean small communities of friends, family or colleagues who have a real need or desire to stay in touch with one another. While there are many ways to provide electronic interaction, perhaps the most promising approach relies on casual interaction. The general idea is that members of a distributed community track when others are available, and use that awareness to move into conversation, social interaction and work. On the popular front, we see support for casual interaction manifested through the explosion of instant messaging services: a person sees friends and their on-line status in a buddy list, and selectively enters into a chat dialog with one or more of them. On the research front, my group members and I are exploring the subtler nuances of casual interaction. We design, build and evaluate various groupware prototypes [1,2,3,4] and use them as case studies to investigate:

- how we can enrich on-line opportunities for casual interaction by providing people with a rich sense of awareness of their intimate collaborators;
- how we can supply awareness of people's artifacts so that these can also become entry points into interaction;
- how we can present awareness information at the periphery, where it becomes part of the background hum of activity that people can then selectively attend to;
- how we can create fluid interfaces where people can seamlessly and quickly act on this awareness and move into conversation and actual work;
- how we can have others overhear and join ongoing conversations and activities;
- how we can make these same opportunities work for a mix of co-located and distributed collaborators; and
- how we balance distraction and privacy concerns while still achieving the above.

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