

**Human-Computer Interaction**  
**INTERACT '03**

## **IFIP—The International Federation for Information Processing**

IFIP was founded in 1960 under the auspices of UNESCO, following the First World Computer Congress held in Paris the previous year. An umbrella organization for societies working in information processing, IFIP's aim is two-fold: to support information processing within its member countries and to encourage technology transfer to developing nations. As its mission statement clearly states:

IFIP's mission is to be the leading, truly international, apolitical organization, which encourages and assists in the development, exploitation and application of information technology for the benefit of all people.

IFIP is a non-profit making organization, run almost solely by 2500 volunteers. It operates through a number of technical committees, which organize events and publications. IFIP's events range from an international congress to local seminars, but the most important are:

- the IFIP World Computer Congress, held every second year;
- open conferences;
- working conferences.

The flagship event is the IFIP World Computer Congress, at which both invited and contributed papers are presented. Contributed papers are rigorously refereed and the rejection rate is high.

As with the Congress, participation in open conferences is open to all and papers may be invited or submitted. Again, submitted papers are stringently refereed.

The working conferences are structured differently. They are usually running by a working group and attendance is small and by invitation only. Their purpose is to create an atmosphere conducive to innovation and development. Refereeing is less rigorous and papers are subjected to extensive group discussion.

Publications arising from IFIP events vary. The papers presented at the IFIP World Computer Congress and at open conferences are published as conference proceedings, while the results of the working conferences are often published as collections of selected and edited papers.

Any national society whose primary activity is in information may apply to become a full member of IFIP, although full membership is restricted to one society per country. Full members are entitled to vote at the Annual General Assembly. National societies preferring a less committed involvement may apply for associate or corresponding membership. Associate members enjoy the same benefits as full members, but without voting rights. Corresponding members are not represented in IFIP bodies. Affiliated membership is open to non-national societies, and individual and honorary membership schemes are also offered.

# Human-Computer Interaction INTERACT '03

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## Editors' Preface: Past, Present, and Future

The inaugural IFIP TC13 chair Brian Shackel is quoted as saying that

“From early days (cf Licklider & Clark, 1962) the need for larger displays has been emphasised; but just when it seemed, in the late 1980s, that full page and larger displays would come with lower prices, the focus in the industry turned to portability and we moved backward to smaller screens. While there was some improvement, larger screens (eg 21 inch CRT displays) are still not available at an acceptable price; as long ago as 1977 Kay & Goldberg (1977) in their Dynabook concept specified a display the size of a full paper page, but I know of no portable laptop, let alone notebook, which has an A4 page size screen.” (Brian Shackel, 2000)

Today the situation has changed, and we are happy to recognize the improvements made by industry in order to satisfy the needs of customers and users. In the past, these developments included attempts to achieve "man-machine symbiosis" (Licklider, 1960), the "augmentation of human intellect" (Engelbart, 1963), the "Dynabook" (Kay and Goldberg, 1977), and "ubiquitous computing" (Weiser, 1991). This line of development resulted in a number of important building blocks for HCI. Some of these building blocks include the mouse, bitmapped displays, personal computers, windows, the desktop metaphor and point-and-click applications. Research on operating systems, meanwhile, has developed techniques for interfacing a variety of input/output devices, for tuning system response time to human interaction times, for multiprocessing and for supporting windowing environments and animation.

Many early problems faced by researchers working on human factors had strong sensory-motor features. The problem of the operation of computers by humans was a natural extension of classical human factors concerns, except that the new problems had substantial cognitive, communication and interaction aspects not previously encountered in human factors. Ergonomics is similar to human factors, but it arose from studies of work practice. As with human factors, the concerns of ergonomics tended to be at the sensory-motor level, but with an additional psychological flavour and an emphasis on stress. Human interaction with computers was also a natural topic for ergonomics, but again, a cognitive extension to the field was necessary, resulting in the current "cognitive ergonomics" and "cognitive engineering." Because of their roots, ergonomic studies of computers emphasize the relationship to the work setting and the effects of stress factors, such as the routine of work, sitting posture, or the visual design of displays. Industrial engineering arose out of attempts to raise industrial productivity starting in the early years of the last century. The early emphasis in industrial engineering focused on the design of efficient manual methods for work, the design of specialized tools to increase productivity and reduce fatigue, and, to a lesser extent, the design of the social environment.

Interaction with computers is an important topic for the field of industrial engineering in the context of how the use of computers fits into the larger design of work methods. In addition, the growth of discretionary computing and the mass personal computer and workstation computer markets have meant that sales of computers are more directly linked to the quality of their interfaces than in the past. This has resulted in the gradual evolution of a standardized interface architecture from hardware support of mice to shared window systems to application layers. Along with these changes, researchers and designers have begun to develop specification techniques for user interfaces and testing techniques for the practical design and production of interfaces.

As the technological and social contexts have changed, so the focus of HCI has changed accordingly. It is now time to consider HCI not just from a technical point of view, but also from an ergonomic, design and artistic point of view. One of the most prominent perspectives that has emerged is the user-centered design (UCD) paradigm. This conference presents an excellent opportunity for people from different backgrounds and expertise to meet and discuss the state of the art and the future of HCI.

We hope this conference will open new doors to the future for HCI developers, researchers and societies throughout the world.

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## References

- Engelbart, D (1963), A Conceptual Framework for the Augmentation of Man's Intellect. In *Vistas in Information Handling*, (Howerton and Weeks, Eds.), Spartan Books, Washington, D. C., pp. 1-29.  
Republished in *Computer Supported Cooperative Work: A Book of Readings*, (Irene Greif, Ed.), Morgan Kaufmann Publishers, 1988, pp. 35-65.
- Kay, A. & Goldberg A. (1977), Personal Dynamic Media. *IEEE Computer*, 10(3), 31-41.
- Licklider, J. C. R. (1960), Man-computer symbiosis. *IRE Transactions on Human Factors in Electronics*, 1, 4-11.
- Licklider, J. C. R. & Clark, W. E. (1962), On-Line Man-Computer Communication. In *Proceedings Spring Joint Computer Conference*, Vol. 21, pp. 113-128 (National Press, Palo Alto, California).
- Shackel, B. (2000), 2000 People and Computers - Some Recent Highlights. *Applied Ergonomics*, 31(6), 595-608.
- Weiser, M. (1991), The computer for the 21st century. *Scientific American*, 265(3), 94-104.

## Editors' Note

The proceedings contain 91 full papers, 8 doctoral consortium papers, 55 short papers, 8 tutorial papers, 1 panel paper, 9 workshop papers, 13 poster papers, 12 interactive experience papers, 4 video papers, 8 system demonstration papers, 8 HCI societies papers, 8 organizational overview papers, and 4 special interest group papers, that were accepted for presentation at INTERACT'03 following an open call for participation.

Submissions and the reviewing process reflect the international nature of INTERACT: 241 full papers, 12 doctoral consortium papers, 125 short papers, 19 tutorial proposals, 3 panel proposals, 13 workshop proposals, 18 poster submissions, 15 interactive experience proposals, 6 video papers, 10 system demonstration papers, 10 HCI societies papers, 11 organizational overview papers, and 5 special interest group proposals.

Each submission was reviewed by at least 3 referees drawn from the International Program Committee of 202 HCI experts from 28 different countries (1 Afghanistan, 15 Australia, 3 Austria, 2 Belgium, 1 Brazil, 4 Canada, 1 China, 2 Denmark, 2 Finland, 11 France, 21 Germany, 2 Greece, 1 Israel, 5 Italy, 15 Japan, 12 Netherlands, 9 New Zealand, 2 Norway, 1 Poland, 5 Portugal, 1 Romania, 2 Singapore, 4 South Africa, 7 Spain, 5 Sweden, 10 Switzerland, 19 UK, 39 USA), and the 36 members of the Technical Programme Committee.

The final conference program, as represented in this volume, was selected on the basis of (1.) referees' ratings and comments, (2.) administrative requirements (copyright form, style/format, etc), and (3.) program balance.

## IFIP TC13

Established in 1989, the International Federation for Information Processing Technical Committee on Human-Computer Interaction (IFIP TC13) is an international committee of 29 member national societies and 5 Working Groups, representing specialists in human factors, ergonomics, cognitive science, computer science, design and related disciplines. INTERACT is its flagship conference, staged biennially in different countries in the world. The next INTERACT conference, INTERACT 2005, will be held September 12-16 in Rome, Italy.

IFIP TC13 aims to develop a science and technology of human-computer interaction by encouraging empirical research, promoting the use of knowledge and methods from the human sciences in design and evaluation of computer systems; promoting better understanding of the relation between formal design methods and system usability and acceptability; developing guidelines, models and methods by which designers may provide better human-oriented computer systems; and, co-operating with other groups, inside and outside IFIP, to promote user-orientation and “humanisation” in system design. Thus, TC13 seeks to improve interactions between people and computers, encourage the growth of HCI research and disseminate these benefits world-wide.

The main orientation is towards users, especially the non-computer professional users, and how to improve human-computer relations between them. Areas of study include: the problems people have with computers; the impact on people in individual and organisational contexts; the determinants of utility, usability and acceptability; the appropriate allocation of tasks between computers and users; modelling the user to aid better system design; and harmonising the computer to user characteristics and needs.

While the scope is thus set wide, with a tendency towards general principles rather than particular systems, it is recognized that progress will only be achieved through both general studies to advance theoretical understanding and specific studies on practical issues (e.g. interface design standards, software system consistency, documentation, appropriateness of alternative communication media, human factors guidelines for dialogue design, the problems of integrating multi-media systems to match system needs and organizational practices , etc.).

IFIP TC13 stimulates working events and activities through its Working Groups. WGs consist of HCI experts from many countries, who seek to expand knowledge and find solutions to HCI issues and concerns within their domains, as outlined below:

In 1999, TC13 initiated a special IFIP Award, the Brian Shackel Award, for the most outstanding contribution in the form of a refereed paper submitted to and delivered at each INTERACT. The award draws attention to the need for a comprehensive human-centred approach in the design and use of information technology in which the human and social implications have been taken into account. Since the process to decide the award takes place after papers are submitted for publication, the award is not identified in the Proceedings.

**WG13.1 (Education in HCI and HCI Curricula)** aims to improve HCI education at all levels of higher education, coordinate and unite efforts to develop HCI curricula and promote HCI teaching;

**WG13.2 (Methodology for User-Centered System Design)** aims to foster research, dissemination of information and good practice in the methodical application of HCI to software engineering;

**WG13.3 (HCI and Disability)** aims to make HCI designers aware of the needs of people with disabilities and encourage development of information systems and tools permitting adaptation of interfaces to specific users;

**WG13.4 (also WG2.7) (User Interface Engineering)** investigates the nature, concepts and construction of user interfaces for software systems, using a framework for reasoning about interactive systems and an engineering model for developing user interfaces;

**WG13.5 (Human Error, Safety and System Development)** seeks a framework for studying human factors relating to systems failure, develops leading edge techniques in hazard analysis and safety engineering of computer-based systems, and guides international accreditation activities for safety-critical systems.

New Working Groups are formed as areas of significance to HCI arise.

Further information is available at the IFIP TC13 website: <http://www.ifip-hci.org/>

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All IFIP Member Societies

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BCS-HCI - British Computer Society Special Interest Group (UK)

BrazilCHI - Brazil's SIGCHI Chapter of the ACM (Brazil)

CHI-SA - South African's Chapter of the ACM (South Africa)

CHISIG - Special HCI Interest Group (Australia)

Dutch SIGCHI.NL (The Netherlands)

European Association of Cognitive Ergonomics (EACE)

German Informatics Society (Germany)

Human Interface Society (Japan)

SI - Swiss Informatis Society (Switzerland)

SIGCHI Italy - Italian association of HCI (Italy)

SIGCHI-NZ - New Zealand's Chapter of the ACM (New Zealand)

STIMDI - Swedish Interdisciplinary Interest Group for HCI (Sweden)

SwissCHI - Software Ergonomics (Switzerland)

UPA - Usability Professional Association

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