British HCI Group
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# Interfaces

56 • Autumn 2003

## Conference Programme inside!

Designing for Society
BATH
HCI 2003
8–12 September

## Reports from

- CHI 2003
- HCI Educators 2003
- IDC 2003

## Email, icons, eye-tracking

## HCI 2004 preview

## … and …

**Gilbert Cockton** deflects democracy

**Cassandra** gets at the GUTs of HCI

**Eamonn O'Neill** reveals all to Alan Dix

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**Human–Computer Interaction**

# View from the Chair

## My other hobby is a PC

This column is arriving with Laura later than intended, and the reason boils down to layers of tension between computers and home life, several of which involved drivers for USB 2.0 devices but were exacerbated by the stress of constant exposure to low-level noise. Ten years ago a colleague observed that the sheer volume of a home PC would be too disruptive to domestic harmony. Things haven't changed. I specifically sought quiet components for my current PC yet still the sound obtrudes and it's plainly not fit for purpose.

All of which brings me to the conference theme for Bath this September. One tack to consider as we Design for Society is to what extent are we successful in integrating IT with our real activities, or are we still in the era of "my other hobby is home computing"?

Certainly, twenty years ago using computers as a cheap way of producing music succeeded only in getting me into IT and killing off my music career. Now I'm forcing my skateboarding son to learn the technology instead of being creative. Of course from Spectrums, MSX, Atari and, yes, Apple, my history of personal computing is littered with cool, overpriced technology that never quite does what it says on the box. Next!

I have a friend, a retired medical professor (amongst other things), whose hobby is photography. For the last five years he has been building his computer collection to support his hobby. Once or twice a year, I help him make the technology support his activity, rather than be a barrier. We've defragged, de-virused, debugged colour profiles, made Word 2000 and Access97 (both of which were not cheap) somehow cohabit (if not be usable at the same time), and traced dozens of other strangenesses that, if documented, might turn this column into Jerry Pournelle's Chaos Manor at byte.com

"What is the average person supposed to do?" my friend asked last time, and I don't know, other than trust in Bill's mission to integrate our personal lives with technology, and indulge in endless lifelong learning. There are many other aspects of society for which we will design in Bath this year, but the personal is still political, and, in echo of Cassandra's recent observations on PowerPoint, we can usefully start by reflecting on our own day-to-day use of personal technologies, identify incrementally simpler ways of carrying out real activities, and communicate them to vendors through this community.

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# contents

# Editorial

Welcome to Interfaces 56 and HCI 2003!

This issue contains the programme for the HCI 2003 conference which takes place in Bath, from 8th to 12th September. Although the programme is as final as could be at the beginning of August, there will inevitably be slight changes so keep an eye on the conference website for such details: www.hci2003.org.

As everyone is currently thinking about designing for society, this issue looks at who 'society' is and how to design for it. Janet Read, Daniel Lutz, and Madelon Evers look at how to design for children and how to include them in the design process by using participatory design methods, Paul Englefield argues that we should evade stereotypes by designing for users' tasks, not for their demographics, and Janet Finlay previews HCI 2004 – Design for Life.

Meanwhile, Tony Renshaw introduces us to his PhD work in which he is looking at how visual interface design is related to usability and how to design for more efficient eye movements, Dale Richards tells us how to measure the efficiency of icons, and Chris Rourke reports on efforts at CHI 2003 to assess the effectiveness of expert evaluations and usability testing. Sally Fincher, also reporting on CHI 2003, introduces PLML, a new specification for bringing order to HCI patterns. Peter Purgathofer, Konrad Baumann, David Benyon, and Deryn Graham discuss aspects of HCI education, and Adrian Williamson ponders the properties of email.

Regulars Cassandra and Gilbert are also present: Cassandra recovers from her malfunctioning machine and pleads for making mundane, everyday things usable, and Gilbert discusses the pros and cons of democracy (or lack thereof) in the British HCI Group and SIGCHI. If you want to get in on the act, come to the British HCI Group's AGM which takes place at the conference on Wednesday 10th September at 6.15pm. And finally, there's a satisfying stack of book reviews supplied by the new Book Reviews editor, Sandra Cairncross, and Alan Dix gets Eamonn O'Neill, the conference chair, to bare all.

See you in Bath!

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## Right to Reply

Make *Interfaces* interactive! We invite you to have your say in response to issues raised in *Interfaces* or to comment on any aspect of HCI that interests you. Submissions should be short and concise (500 words or less) and, where appropriate, should clearly indicate the article being responded to. Please send all contributions to the Editor.

**To receive your own copy** of *Interfaces*, join the British HCI Group by filling in the form on page 35 and sending it to the address given.

## Next Issue

*Interfaces* welcomes submissions on any HCI-related topic, including articles, opinion pieces, book reviews and conference reports. The next deadline is **15 October**, but don't wait till then – we look forward to hearing from you.

with thanks to commissioning editors:
Book Reviews: Sandra Cairncross, s.cairncross@napier.ac.uk
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Profile: Alan Dix, alan@hcibook.com
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page 12 and cover Human Shareware

Deadline for issue 57 is **15 October 2003**. Deadline for issue 58 is **15 January 2004**. Electronic versions are preferred: RTF, plain text or MS Word, via electronic mail or FTP (mail fiona@hiraeth.com for FTP address) or on Mac, PC disks; but copy will be accepted on paper or fax.

**Send to: *Interfaces*, c/o Laura Cowen, Mail Point 095, IBM United Kingdom Laboratories, Hursley Park, Winchester Hampshire, SO21 2JN**
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**and** copy email submissions **to Fiona Dix, *Interfaces* production editor; email: fiona@hiraeth.com**

PDFs of *Interfaces* issues 35–55 can be found on the B-HCI-G web site, www.bcs-hci.org.uk/interfaces.html

Gilbert Cockton

# Would You Vote for an End to World Domination?

SIGCHI members among you may have been surprised to find me standing for SIGCHI Chair, and perhaps even more surprised by the blank candidates' statement for Kristina (Kia) Höök and I. Surely BHCIG's mythical Professor Evil, so intent on world domination and never short of words, would not stay deliberately silent? So what really happened (and why, or why should you care)?

Candidates for election are approached by a SIGCHI nominating committee. I served on the last nominating committee and have been approached since 1995 to stand for Executive Committee. In 1995, I agreed and found myself unable to withdraw. Since then I have found being approached or approaching tedious. It can take up much community time. Why do we bother? Largely because ACM insist on contested elections. Even when no-one wants to stand against clearly qualified and popular candidates, the nominating committee must keep calling up friends and associates to see who might stand. So, Kia and I agreed to spare the nominating committee further tedium and filled in the forms to make a real election possible. So here you are. Enjoy. I'm already chair of the British HCI Group and can't possibly chair the two largest HCI organisations in the world. I've never served on an EC. Kia has only served on the Extended EC and just has a new job. Let's face it, we're not good candidates, but we'll help our rival and wholly appropriate candidates when they are elected (let's be clear, elect us and we won't serve). Vote Joe and Mary, then get the bylaws changed!

SIGCHI and BHCIG do things differently. SIGCHI has a constitution with bylaws. BHCIG has Rachel (née Birnbaum) Benedyk's draft constitution from the late 1980s (which Rachel recently unearthed because BCS Specialist Groups may need constitutions). SIGCHI has elections and a nominating committee *must* ensure a contest for all posts. BHCIG has a slate that is graciously offered for approval at the AGM, with all the mechanics of succession resolved well before the annual conference. The BCS rightly has elections for Council, but do SGs really need them?

Already busy with my native HCI group, I actually had no interest in extending my mythical HCI world domination to include the world's one HCI superpower. The truth can now be told. We were 'sacrificial candidates' who stepped up to spare the nominating committee further misery. I'd been there myself. It's a bizarre experience calling friends, close colleagues and complete strangers in a half-hearted attempt to persuade them to stand for something that they have never experienced (or even considered or heard of), especially when the caller hasn't served on a SIGCHI Executive Committee either. Somehow one's credibility with friends and colleagues takes precedence over ACM's zeal for the trimmings of a real election. So, talk soon turns to friends, partners and family, projects, proposals and community gossip.

SIGCHI Executive Committees generally do not throw up two serious contenders for chair. You can imagine what an Executive Committee with two battling future chairs is like. This year, Joe Konstan was the clear "people's favourite" for SIGCHI chair. No experienced and well-informed member of the HCI community would stand against him. Still, elections appear to really matter to the ACM, so Joe (and his equally capable running mate Mary Czerwinski) had to be opposed. So, after approaches reached Kia (in Sweden) and the UK community (via me), we decided to save the nominating committee from further weary emails and phone calls.

We happily explained our tactics in our candidate statement, but ACM thought that it reflected badly on both them and us. We thus graciously allowed a blank statement to speak for itself. It had a certain semantic content. See the box for the text they didn't want to print.

Kia and I luckily only polled 30% of the relevant vote. I'm touched by how many did vote for us in the circumstances. Perhaps the sight of a silent Gilbert was overwhelming and brought votes of gratitude. Who knows? Still, warm congratulations are due to Joe and Mary. SIGCHI is in great hands for the next two years, with an excellent highly experienced Executive Committee (albeit 100% US-based).

So, what's the point? The point is, do specialist groups need elections, especially with turnouts under 10%? Should elections be imposed in the face of community consensus? Which is better and why: the British approach of fixes crafted after reasonable discussion; or the American approach of letting a small group of voters decide, on the basis of up to 200 words, to potentially elect someone with no experience at all of working peer-to-peer with hundreds of volunteers from the HCI community?

Does ACM need to change its SIG bylaws? Which is better for a SG: Organisational Continuity or Radical Amnesia? Would you rather be stuck with someone for two years in a committee post who cannot, or will not, do the job, or be able to firmly suggest that poor performers step aside or at least start working with the rest of committee? Come to the BHCIG AGM at HCI 2003 in Bath and let us hear your views on how *your* group should be run. And more importantly, step up and do some of the running. Vote for yourself now and turn up to receive your spoils in Bath.

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# Designing for Freda

**Paul Englefield**

Cassandra's recent quest for Donna Norman (*Interfaces* 55) reminded me of the challenge of designing for Freda Bloggs. A journalist recently asked myself and my colleague Vanessa Donnelly how we would design an interface specifically for a female audience, citing recent research at Microsoft suggesting that larger screens could minimize the impact of gender-related differences for specific cognitive skills.

This would be easy enough to tackle as an exam question. One might firstly cite research from fields such as psychology, education and marketing, consider claimed cognitive and behavioural differences, discuss the statistical rather than categorical nature of those differences, distinguish innate from cultural characteristics and then systematically select and justify a set of factors considered significant and relevant to the design problem.

From these factors you might then derive a set of design principles tested by some form of design rationale or claims analysis process. However, life is not an exam. With respect to the commercial practice of design, Vanessa and I found the question challenging and potentially dangerous. Before I propose a pragmatic practitioner's answer, I'd like to consider some related questions.

*Is it useful or appropriate to design primarily for a single user characteristic such as sex, age, or education level?*

I'm concerned that designing for a single trait escalates the risks associated with invoking social stereotypes, applying theory out of context, and distancing design proposals from the fuzzy complexity of the real world.

I'm not advocating simple-minded political correctness so much as a recognition that stereotypes can be powerfully misleading; awareness of the mechanisms of bias guarantees no immunity from their effects. Designers might usefully take guidance from social psychology in considering behaviour as determined more by social context than individual characteristics.

Furthermore, theories, like battle plans, rarely survive first contact with reality. For example, Alan Dix tells the story of a structured email system called Coordinator in which the design's adherence to Winograd and Flores' Conversation for Action model conflicted with the users' need for flexibility and control.

Non-trivial theories associated with single traits carry similar risks. Design for aging eyesight is sensible. Designing a navigation system for a female audience strictly around landmarks (in response to Riepes' work on gender-different neural networks) may be premature and risky.

Finally, user profile dimensions are not necessarily independent. The whole is typically greater than the parts, and designers may be unable to determine which individual characteristics are critical until the design space is better understood. To inform design, I like to understand not only the distribution of characteristics such as age, sex and experience, but also how these characteristics interact with each other, with the physical and social environment, and with the goals and tasks that the design should support.

*Should we use the classical dimensions of user profiles simply as a heuristic framework for elicitation or as a coding scheme to build a formal model of user populations?*

While it would be interesting to research the utility of using a coded representation for locating related, reusable design assets held within a practitioner support library, I am wary of highly structured analysis of this material. Rather than pinning users to a mathematical point in n-dimensional space, I find it more helpful to think of profiles as a flexible network of interacting influences. Again, the whole is greater than the parts.

*How much emphasis should we place on the differences in cognitive style between men and women?*

In my experience, attention to users' goals and tasks provides the data most critical to design success. Let's optimistically assume that that's a given and consider the importance of cognitive distinctions. Much current commercial design pays little attention to the most basic demands of human cognition. Many web sites, desktop applications, and games continue to frustrate users of all ages, sexes, and skill levels.

Long hours in the lab have convinced me that while users are adept at puzzling out poorly crafted designs, they rarely appreciate the challenge. Given the low general maturity of pervasive interface design practice, consultants and educators still have much to do to promote the fundamentals of design to support human learning, perception, attention and memory.

In this context, designing for subtle differences related to spatial skills, navigational strategies, field dependence, and divided attention is reminiscent of spitting on a bonfire.

There may be more value in informing design by adapting research from social psychology. For example, the coffee-bar gossip in our team is pretty much okay with the claim that women have a strong interest in developing and maintaining social networks, and we've had some useful discussions about how this idea might influence conceptual design. However, I would again be wary of driving design from theory alone. If it's important and relevant, it's likely to emerge from primary research with the target audience.

*How do we proceed from eliciting user profiles to establishing a design direction?*

My perception, as a teacher and practitioner, is that HCI largely remains a methodologically fragmented discipline in which a set of proven methods, such as user profiles, task analysis, and information architecture, are integrated within a field of good intentions and informal philosophical beliefs. Consequently, I'd like to generalise this question to ask how we systematically transform user data into design.

In the IBM design community, User Engineering recommends *measurements* as the link between requirements and design. Analysis and interpretation of user and business requirements yields a set of measurable targets that can be shown to relate to quantitative models of expected return on investment, inform the design direction, and enable evolving design iterations to be evaluated with respect to the original design goals.

In other words, a thoughtfully designed measurement acts as a connection between user research and design, and can be supported by both data and argument. For example, if user profile research shows that the intended audience are wary of technology, the design team might set and track measures related to ease of learning, attractiveness, and intention to adopt.

OK, enough equivocation. My answer to the original question is that I would avoid designing an interface specifically for a female audience. For that matter, I would not choose to design a solution specifically for guys, teenagers, silver surfers, or any demographically defined category vulnerable to over-generalisation and social stereotyping.

On the other hand I'd be delighted to design a solution for parents of young children who might be predominantly young and female but who would prefer to define themselves by shared goals, tasks, values, and ways of thinking about the world. I'll emphasise again that I make these distinctions out of a concern for design team effectiveness rather than a taste for gratuitous political posturing.

So let me clarify this tedious argument of insidious intent. I'm making a case for driving design from an amalgam of primary research and theory, and for remembering that any theory we draw on operates within a subtle ecology of theory, constrained and distorted by context.

Here be dragons. Proceed with care.

I've enjoyed the recent debate about what we call our discipline but I still like the term User-Centred Design. It does what it says on the box – designs for people rather than abstractions.

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# HCI Educators 2003 presentations

## The A-B-C (Appropriateness, Benefits and Costs) of D-E-F (Distributed, Electronic and Face-to-Face) learning in HCI

As promised in issue 55, three more presenters from the HCIE2003 workshop have written short summaries of their presentations for *Interfaces*. The full proceedings of the HCIE2003 workshop are available in *Effective Teaching and Training in HCI – Proceedings of the 6th HCI Educators Workshop*, 2003. (Eds) Sandra Cairncross, Alison Varey, Tom McEwan. LTSN-ICS. ISBN 0-9541927-2-9. This publication can be ordered directly from LTSN.

The next HCI Educators workshop will take place at the HCI 2003 conference in Bath in September.

# Designing Interactive Systems: Human-Centred Interaction Design

### David Benyon

In these days of pervasive and ubiquitous computing, traditional human–computer interaction (HCI) seems to be lacking – primarily in terms of philosophy and concepts – for dealing with the sort of design and engineering that developing for new technologies demands. Drawing upon the methods, philosophy and concepts of interaction design (ID) – which comes from the artist-designer tradition, rather than the engineer-designer – this paper looks at an emerging discipline of designing interactive systems.

Designing interactive systems is concerned with developing high quality interactive experiences and products that fit with people and their ways of living. It has arisen out of the disciplines of human–computer interaction and interaction design, and shares many characteristics with both of these to the extent that both HCI and ID professionals should be happy to identify with the concepts and approach.

Designing interactive systems is an emerging discipline that deals with the design of experiences for people in the age of pervasive and ubiquitous computing. It is about designing interactive systems, services and products from a human-centred perspective. It is about designing software systems, web sites, games, interactive products such as MP3 players, digital cameras, and applications for personal digital assistants (PDAs). It is about designing whole environments – information spaces – in which phones, PDAs, laptop computers, digital projectors and other devices communicate with one another and through which people interact with one another. It is about designing interactive systems and products for the home, for work, or to support communities (Benyon, Turner and Turner, 2004).

Just as architects work with buildings and fashion designers work with textiles, so interactive systems designers work with, and through, 'new media'; the medium of interactive systems. A medium both affords opportunities and imposes constraints on designs. Designers work and transform media through using tools (McCullough 2001).

The medium that the interaction designer has to work with consists of all the different forms and functions of input and output and all the manipulations that can be performed on the content. The interaction designer has to work with all the agents, devices and information artifacts that constitute a domain. Good interactive system designers will understand this medium and how combinations of components will result in an engaging interaction. They are creators of information spaces (Benyon, 2001). Rather than designing systems that support existing human tasks, we are entering an era in which we develop networks of interacting systems that support domain-oriented activities.

Designing interactive systems is concerned with the 'big picture'; broad activities such as going to work in the morning or cooking a meal for some friends. It is about how a collection of information artefacts can both support and make

these activities enjoyable and rewarding. It is the difference between the designer of a dining room table and the designer of a dining experience. There is of course a need for someone to design good furniture but there is also a need for someone to design the whole experience.

This paper is an early attempt to characterise the discipline that is emerging from the combination of HCI and ID. HCI's tradition is engineering, albeit a softer view of engineering than others. ID's background is in creative design, the 'artist designer'. HCI has traditionally focused on the usability of an interaction of a person with a computer. ID has been concerned with experience, concept and the culture of new technologies.

With communication and computing devices becoming increasingly pervasive and ubiquitous we need a convergence of methods, philosophies and concepts from different design backgrounds; HCI, ID and others such as architecture. We need to recognise the importance of engineering and creative design to the medium of interactive systems. We need to take a human-centred approach to the design of information spaces in which people live.

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# A Case Study in the Teaching of HCI

## D. Graham

The poster described a 'real world' example of the teaching of Human–Computer Interaction. The new HCI course at the University of Greenwich is taught as a two semester (30 credit) final year option for the Computer Science degree programme. The course proposed had to deal with the perennial problems of:

- What to teach?
- What text books are available to provide the spine of the course?

The poster highlighted many of the difficulties of an ever expanding HCI domain. It described the conception and development of the new HCI course, its historical background, the justification for decisions made, lessons learnt from its implementation, and questions arising from its implementation that are yet to be addressed. For example, should HCI be taught as a course in its own right or as a component of another course? At what level is the teaching of HCI appropriate, and how is teaching influenced by industry? It considered suitable learning pedagogies, and resource issues, as well as the demands and the contribution of industry.

The experiences presented will no doubt be familiar to many HCI educators. Whilst the poster raised more questions than it answered, the resolution of some questions was achieved by the workshop through a small survey of conference delegates on the teaching and assessment methods employed in UK Higher Education programmes for HCI courses.

A very brief (anonymous, if wished) questionnaire was given out to delegates during the poster sessions with the promise that any findings would be made known in some form. As well as questions on teaching and assessment methods (e.g. lectures and examinations), the questionnaire included questions about HCI courses (numbers of students, levels, etc), and the course literature, especially the text books used.

The data are presently being assimilated. However, the initial findings reveal that the Preece et al and Dix et al text books are used for courses (up-to-date editions of both are now available). Other findings of interest show the level of HCI taught and whether HCI is taught as part of another course (in which case, in what year it is taught) or as a course in its own right.


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# Rethinking HCI Education in the Context of Design Theory

## Peter Purgathofer and Konrad Baumann

HCI education seems to be firmly rooted in its founding disciplines, computer science and psychology. Taking a look at what seems to be a typical discussion of HCI curriculum design [6], we find that one of the central ideas seems to be "the need for an integration of software engineering and HCI". Typically, HCI curricula are embedded into software engineering and/or psychology degrees, as can be seen from many examples in Gary Perlman's excellent web directory of HCI Education [4].

This placement, however, is not without its specific problems. In this article, we want to show that the methodical heritage acquired from science and engineering is counterproductive for HCI education, and that HCI education should better be rooted within the context of design education. This "repotting" of HCI education would have less impact on the HCI curriculum than on teaching methodology.

### Heritage from science and engineering

Wood and Wood-Harper [7] argue that the design of information technologies has been dominated by a rationalistic tradition. The reason for this influence seems to lie in the aforementioned roots of HCI education. As the two key

principles in rationalistic design they cite design as functional analysis, as described by Lanzara [2], and design as problem-solving, most prominently described by Simon [5].

### Design as functional analysis

Design as functional analysis has its roots in the scientific management tradition initiated by Frederic Taylor. It is based upon the assumption that all information about design requirements is available to the designer, and that such information can easily be assimilated. Consequently, the engineer has only to analyse a problem thoroughly in order to have the solution ready at hand. Design as functional analysis assumes that design is a deductive activity.

### Design as problem-solving

Design as problem-solving rejects the rational model of functional analysis, and introduces the concept of "bounded reality", accepting the idea that human beings have cognitive limitations constraining the amount of information that can be absorbed and processed. Since a problem cannot be understood as a whole, it is continually reduced and simplified – bounded – until it becomes sufficiently well defined to be resolved. Next, alternative solutions are evaluated sequentially, until one such solution fits an implicit set of criteria well enough. This solution is called satisficing, in that it satisfies a minimal, rather than optimal, set of solution criteria.

### Problems with rationalistic approaches

Both approaches, design as functional analysis as well as design as problem solving, fail to offer ways of dealing with problems that can stand the test of daily practice. Additionally, neither method can encompass the discovery of new knowledge, in particular the discovery of unstated goals and evaluation criteria. Moreover, these approaches fail to take into account that the point of view from which one looks at a situation determines the problems one sees, as is discussed, for example, in Brian Lawson's *How Designers Think* [3].

The rationalistic tradition of software design is based on a rather deterministic model where the individual ideas, viewpoints, interests and feelings do not change the objective problem itself. Effective, innovative user interface design (and an equally effective HCI education) must stay severely limited in this context. We have to search outside of science and engineering in order to find new role models for the training of user interface design experts.

## Repotting HCI Education

In 1990, Mitch Kapor wrote in his much-cited *A Software Design Manifesto* [1]: "We need to create a professional discipline of software design. [...] Software designers should be trained more like architects than like computer scientists."

The education of architects represents an interesting phenomenon: it is offered within a traditional scientific framework (eg. at the University of Innsbruck, Austria), an engineering framework (eg. at the University of Technology, Vienna), and an artistic framework (eg. at the University of Applied Arts in Vienna). Internationally, architectural education is placed within these three contexts of science, engineering, and art. So why not learn from applied arts and design education in order to advance HCI education?

Curricula are only half of what is necessary in order to educate HCI students. The other half, teaching methodology, is barely covered in these curricula. As a result, these programs often follow other study courses in respect to their teaching methods, reusing methodology from science and engineering education. We think, that in order to train 'software designers' (in Mitch Kapor's sense) we should look at the teaching methods of design education.

## Finding adequate teaching methods

The research described in our poster is dedicated to finding a body of adequate didactical methods for the education of HCI students through the analysis of teaching methods used in design disciplines, such as Architecture, Product Design, Graphic Design and Graphic Arts, Creative Writing and Text Creation. The primary aproach of this study is to conduct guided interviews with educators in the aforementioned disciplines. Our goal is to describe a number of teaching methods suitable for HCI education that fit into existing curricula or can be applied with minor changes.

The interview guidelines focus on the following aspects:

- Teaching methods used within different contexts
- The role of creativity, and how to assess it
- The relationship between practice and theory
- The influence of design 'superstars'
- The value of multidisciplinarity
- The importance of a prescribed design process

Our poster, presented at the HCI Educators workshop in March/April 2003, presented and discussed details of the interview guidelines, as well as preliminary results from the first interviews.

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Both authors are practising HCI educators. Konrad Baumann is coordinator of the major user interface and web design of an information design programme at the Fachhochschule Joanneum Graz. Peter Purgathofer teaches User Interface Design and Interaction Design to graduate and postgraduate students at the University of Technology, Vienna. This work is part of a doctoral thesis project of Konrad Baumann under the supervision of Peter Purgathofer.

# How Effective are Your Icons?

**Dale Richards**

The amount of effort that goes into the design process of building a new interface can be extensive and, to say the least, a lengthy process of iteration after iteration. However, within such an environment of production the issue of representing meaning is often overlooked and left to the end of the design process. Semantic content is typically represented by means of a number of icons implemented within the interface to aid users in their interaction with the system.

The main focus of my research has been to ask important questions as to the very nature of such icons and how we can aid designers (and indeed users) in attaining an icon set that is optimised for the level of interaction between human and computer.

New interfaces often adopt existing icon sets, as the designer and user cling to previous formats that used such icons. However, there are a number of instances where this approach is misguided and can lead to the integration of an icon set that impedes user interaction. This is particularly true when an older paper-based system is supplanted by computer systems (e.g. map symbols, military icons). The icon set might have been perfectly adequate for its original purpose. However, when the icons are applied to an interface and perhaps used dynamically then issues such as visual complexity, confusion, and information overload become apparent.

So what are the important factors that should be addressed when designing an icon set? Much of the research on this topic has drawn from the field of reading research. For example, there has been interest in the characteristics of words that influence how easily they are recalled and recognised (e.g. Reicher, 1969; Paivio, Yuille, & Madigan, 1968; Gilhooly & Logie, 1980).

A number of icon properties have been shown to contribute to usability. These include concreteness, visual complexity, familiarity, semantic distance, meaningfulness, and global and local features (see Rogers, 1986; Byrne, 1993; McDougall, Curry, & de Bruijn, 1999; Navon, 1977). These measures are discussed briefly below.

## Concreteness

This traditionally refers to how the icon depicts actual objects, places, and people with which we are already familiar in the real world. In contrast, abstract icons do not pictorially represent objects, places or people, and tend to use more graphic features to convey information (e.g. arrows, shapes). For example, Figure 1 depicts both concrete and abstract forms of a 'print' icon.


Figure 1. Concrete and abstract depictions of the 'print' function

## Visual complexity

In the past, research has usually concentrated upon the complexity of the visual display (Galitz, 1993) rather than the visual complexity of the individual icons. Design guidelines tend to encourage the use of simple icons, to assist in the reduction of the user's mental workload. Indeed, very early findings suggested that simple icons enhanced user performance (Ryan & Schwartz, 1956). Easterby (1970) and Byrne (1993) also supported the use of simple icons and suggested that simplicity reduces ambiguity and decreases reaction times. If we look back at Figure 1 we can see that the concrete example is indeed more visually complex than the abstract alternative.

## Familiarity

Familiarity is determined to a large extent by the frequency with which icons are encountered. If we think of the icons and symbols that we tend to see on an everyday basis, then it is not surprising that we will tend to recognise these stimuli more readily than a less familiar one. Also, it has been found that learning icon sets can produce familiarity effects and directly influence their usability (e.g. Brems & Whitten, 1987; Margano & Schneiderman, 1987). The traditional print symbol in Figure 1 is very familiar and easily recognisable, while the abstract version is less so.

## Semantic Distance

Semantic distance represents the closeness of the mapping between an icon and its meaning. Early thoughts on this topic suggested that semantic distance was the degree to which the icon matched its function. Moyes & Jordan (1993) highlight the importance of semantic distance, suggesting that it is the degree of the relationship between icon and referent that determines its usability. No prizes for guessing which one of the examples in Figure 1 fits into this category.

## Meaningfulness

The ability to understand and interpret an icon may be said to derive from the way the user seeks to find meaning from an icon. Meaningfulness is thought to be closely correlated with concreteness. Rogers (1986, 1989) examined this topic extensively and found that, when participants were asked to match written functions to icons, performance was poor for abstract icons, and worse when concrete analogies were employed to depict functions. Again, our example would therefore favour the more concrete option.

Other issues may have to be considered within a given icon set, such as colour, orientation, global/local features (in terms of the physical appearance of the icon), but the dimensions discussed within this article represent the more widely established characteristics. However, the story does not simply end here.

As HCI specialists, psychologists, or cognitive engineers, we cannot pass this list to designers and ask them to follow it as a guideline, since interactions between the dimensions can have a detrimental affect on usability. For example, a concrete icon (even though it is visually complex) may still result

in the user performing more poorly in computer-based tasks (in terms of reaction time, recognition, and recall).

If we positively weight any of the icon dimensions then we can manipulate the icon's usability and negate any other confounding effects. For example, a more abstract icon can possess a greater level of familiarity, meaningfulness, and lower semantic distance depending on the experience and other characteristics of the specific group of users. For example, the abstract icon in Figure 2 is familiar to more than others (as it depicts the national speed limit) and would elicit better performance and understanding.

Figure 2. The national speed limit sign

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*Volunteer wanted*

### Liaison Officer, British HCI Group Executive

Relations amongst professional bodies and other HCI-related organisations are important to the British HCI Group. As an inclusive and multi-disciplinary organisation we recognise the value of a diverse membership and a collaborative attitude to other bodies. In the past, the British HCI Group has collaborated with such bodies as the French HCI group (AHIM), the UK branch of the Usability Professionals Association, and IFIP. As well as this the group has been involved in HCI initiatives in India, and has links with other organisations and members in a range of countries.

Some discussion about refining and building on these and other relations has taken place and the British HCI Group Executive would like to put these efforts on a more formal footing by recruiting a volunteer to act as a general Liaison Officer.

You will be based within the Membership subgroup, but would expect to update relevant officers on other subgroups. You should be prepared to commit to attend up to four meetings of the Membership subgroup per year, plus other contributions in sub-committee meetings and via electronic communication. Meetings are held all around the country: all expenses are paid for, but all committee members' time is contributed on a voluntary basis. The ideal candidate would be an existing member of the British HCI Group and would show a willingness to cooperate with other people and organisations.

Initial contact should be with Peter Wild, outgoing chair of the Membership subgroup. Please send a CV and cover letter outlining the reasons why you are suitable for the position to:

Peter Wild
pwild@cs.bath.ac.uk
c/o Department of Computer Science, University of Bath
Bath BA2 7AY

# What is Email?

There is much debate in the corporate chamber over the expense and difficulty of storing an organisation's email corpus, potentially for the standard 7 years dictated by company record-keeping legislation. Hands are waving and wringing alternately across the land. The root of this anguish is clearly that the legal profession and its ancillaries have not established legislative or indeed social norms associated with email. Because email appears as the written word the analogy with written legislation has been continued to include retention and legal status. Surely email is more akin to a phone call, counting as informal correspondence? Firms do not record and keep all words spoken on their phone systems, so why should they do the same for email?

These difficulties do not muddy the waters quite so darkly in Scotland, where there is a verbal basis to law (so beware what you promise verbally north of the border!). "I'll buy your parliament building in Edinburgh for [insert ridiculous amount]" could be as legally binding as the written offer from your solicitor.

So a clear-cut case for email being re-classified as informal correspondence that should not be recorded and retained. Not! The same people who gnash their teeth send emails to order goods, confirm acceptance, and exchange legally binding contract details. Do I want these records retained? You bet! So let's accept where email stands in corporate Britain's e-commerce capability and start working on the social norms, morals, ethics and practicalities of creating the next Bibliotheca Alexandrina.


***Adrian Williamson***
*adrianw@gtnet.com*

# Report on Interaction Design and Children 2003

## 'Small Users – Big Ideas'

**Janet Read**

The second Interaction Design and Children event took place between the 1st and 3rd July 2003 in Preston, UK. The event was hosted by the Child Computer Interaction Group (www.chici.org) of the University of Central Lancashire and was sponsored by the Department of Computing.

Before the main conference, delegates were able to limber up by attending a workshop and a tutorial. The workshop, organised by D Lutz and M Evers from Human Shareware (www.humans.nl), involved around 18 adults in a low-tech prototyping exercise with 29 children from a local school. Participants designed a pirate game using sticky tape, magazines, Post-it notes and scissors, and subsequently presented their designs to one another.

Alan Dix entertains

After lunch, an adult group attended a tutorial led by Allison Druin and her team from Maryland, USA. This tutorial (which required delegates to sit on the floor!) involved the evaluation and redesign of some popular children's toys. These two events highlighted many novel interface ideas and participants found them to be stimulating, informative and enjoyable.

The conference proper began at 9.00am on Wednesday 2nd July with a keynote address by Alan Dix from Lancaster University. Alan entertained the audience with his dynamic presentation entitled 'Being Playful – learning from children'.

The conference programme (www.idc2003.org) included 15 full papers that covered a wide range of research findings. In addition, there were interactive demos, posters and a panel discussion. Poster and demo presenters were each given a three-minute slot to 'promote' their work, and the delegates considered this process to be extremely beneficial.

The conference dinner was held at the Preston North End football stadium. An excellent meal was followed by live music from a local folk band that engaged the conference delegates in energetic barn dancing. Delegates remarked on how much they enjoyed the conference social programme. Pictures from the conference dinner, as well as pictures from the paper sessions, can be found on the IDC2003 website.

The second day of the conference began with a keynote address by Yasmin Kafai from UCLA, USA. This talk took a look at some of Yasmin's research on children as software designers and it was good to be able to see how a longitudinal study had evolved over many years. Paper sessions followed and there was a panel discussion based on the question 'Children's Online Interfaces – is usability testing worthwhile?'

At the close of the conference on Thursday afternoon, the programme chair, Stuart MacFarlane, thanked the IDC2003 organisers, student volunteers and participants before handing over the IDC organisation to Allison Druin who invited the delegates to the next Interaction Design and Children Conference which is to be held at the University of Maryland, in June 2004 (www.idc2004.org).

***Janet Read***
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# An Adventure in Participatory Design

**Daniel Lutz & Madelon Evers**

Participatory design is an approach to the assessment, design, and development of technological and organisational systems, which encourages user involvement in all stages of the design and decision-making process. At this year's Interaction Design & Children Conference in Preston (www.idc2003.org), Human Shareware devised and led a participatory design workshop, setting the stage for two days of research presentations about the design of interactive media with, and for, children.

Seventeen adults and 25 children (ages 9–11) from a nearby school worked in mixed teams of adults and children. In two hours, teams developed a paper prototype of an interactive pirate adventure. The creative process used structured exercises of 15–20 minutes each, an interim review of work, and a final presentation – made by the children – of each adventure concept.

The aim was not to create a 'perfect' interactive concept, but to raise awareness amongst adults of issues involved in working with groups of children to develop a design. Amidst great bustle, noise and a lot of fun, adults experienced how important it is not to 'lead' the design process but to listen actively to what children have to say, and how to encourage shy children to share – at times brilliant – ideas about how to proceed on the design of an adventure.

During an evaluation held with adults after the workshop, many participants expressed surprise at the way children, who were pegged by accompanying teachers at the start of the workshop as 'problem children' (troublemakers), were actually some of the most enthusiastic and perfectionist participants. As one adult participant admitted: "you make your mind up about who is going to be trouble or not, although that's not always the reality". We decided that perhaps we adults should not make up our mind too quickly – consciously or not – about what the reality is in terms of potential users of the programmes we develop.

There was astonishment about the focus on weapons and violence in relation to the adventure – by girls! – which made many adults think about the role of computer games on children's cultural and mental imagery. Another participant realised through the workshop just how different children

are now than when he was young – for example in their interest in – and knowledge of – sex and relationships (this was a theme his team apparently discussed during the concept development process).

Many adults mentioned that they had not anticipated such 'sophisticated' children, who were capable of staying focused, being quite self-assured in assessing ideas. It was jarring for some of the adults to see how easily children rejected their suggestions, and came back with an alternative. The 'incredible energy', and 'ease' with which children constructed stories together, as a team, was an eye opener. Other participants remarked how the children were almost automatically thinking in multiple levels, and in layers of interactivity. This was certainly not a skill most of the adults felt that they had grown up with.

The adults considered the children as less able to make use of the iterative process; the children often didn't really listen to each other or take feedback and new ideas back into the story. However, some of the adults in the teams tended to 'dominate' the creative process and tell the children, almost in a teacher role, what to write down as a story.

We could not conclude, therefore, that adults or children are stellar at active listening or collaboration. Facilitation was needed at times to ask both adults and children to respect each others' statements, to listen during the presentations and to give each other space to explain what they meant. It appears these social skills are not automatic in team work, and may need to be 'coached' during participatory design sessions. We also noticed that adults tended to focus mainly on a story, making a logical sequence of events; children focused on interactivity, talking about high scores, navigation, wearable items, etc., with less regard for story. The kids showed much more agility in putting together very abstract ideas/concepts and being less literal than the adults.

Many adults noted that the group process did not actually seem different for children, and that children were actually just as capable as adults. This gave pause for thought about 'specially developed' programmes for children, and whether it would not be more useful simply to use adult formats and observe carefully what children do with these.

In developing these workshops, we combine a variety of creative exercises and inter-team presentations to help teams explore more dimensions of a common concept. This allows participants to use diverse modes of social interaction, and draw on different strengths in the team (visual, text-based, oral, physical). For example, a little girl who was silent throughout most of the process really shone at presentation time, directing her team's final presentation rehearsal and explaining the whole concept to the audience from her perch on top of the table!

## Summary

The workshop was evaluated by participants as a good way to help teams design less for stereotypical children, and more for real, complex, contradictory people, based on first-hand experience with actual children. Participatory design helps stretch boundaries of what is considered possible, attractive and usable, since collaboration between children, researchers, and designers confronts more perspectives on one idea. Children get to work on an equal footing with adults, and adults can experience what "lives" for a particular age group of children at close quarters.

*Daniel Lutz & Madelon Evers*
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Human Shareware runs these interactive concept development workshops for diverse groups of participants, both adults and children. We designed the format that was offered at IDC2003 in 1995 and have developed it for use with clients such as the BBC, Cinekid Festival, SIGCHI.nl, the Media Academy Hilversum, and diverse universities in Europe.
Human Shareware was set up in 1995 to support people to learn in a fun, challenging and interactive way. Core activities are concept development for educational media, consultancy, and training. For more information, see www.humans.nl

Designing for Society

BATH

HCI 2003

The next two pages contain the programme for HCI 2003 (subject to change). Then, to help you decide which sessions interest you, the subsequent pages contain short summaries of each session listed in the programme.

# Wanted: Reports on HCI 2003 sessions

## Contribute to *Interfaces* 57

Okay, I'm going to be at HCI 2003 notepad and pen in hand (and laptop on my back) but try as I might, with sessions running in concurrent 'tracks', there is no way in this world of reviewing everything.

And that's where you come in.

If you attend a session at HCI 2003 and you have something to say about it - say it! Write a short review for *Interfaces*. It doesn't even have to be that long – 300 words is enough (there are just 256 in this plea, not much is it?) but write more if you want to. Just say what the session was about, what you found interesting, what you did or didn't like about the session, and anything else that strikes you as being important. If you left a session discussing it with a friend, then you must have something to say! So write it down and email it to me later. If you take any photos, send them too – I'll make sure you're credited.

You can cover a single presentation, a whole session of papers in a track, a whole day, or even your overall impressions of the conference – it's up to you. Hopefully, if enough people take part, *Interfaces* 57 will be able to cover the entire conference (including the socials).

The submissions deadline for *Interfaces* 57 is 15th October and my email address is laurajcowen@yahoo.co.uk

Laura Cowen, Editor

Key to tutorial and workshop titles on page 14–15

T1: Using design space analysis
T2: Who needs this technology and why?
T3: Phone usability testing
T4: The art of seeing
T5: Systemic task analysis
T6: Creating highly satisfying user experiences
T7: Information visualization
T8: Working with & analyzing qualitative data
T9: Setting usability performance requirements
W1: Decision making among HCI researchers
W2: Benefits management and HCI
W3: Designing for civil society
W4: Accessibility of distance learning
W5: Temporal aspects of tasks
W6: Metaphor and HCI
W7: Genres, use qualities & interactive artifacts
W8: Accessibility issues for interactive TV
HEW: HCI Educators' Workshop: Making learning standards invisible

# HCI 2003 - Keynote speaker

## Andrew Pinder, the e-Envoy

Andrew Pinder is the opening keynote speaker on Thursday.

See *Interfaces* 55 (or www.bcs-hci.org.uk/hci2003/confprog-keysp.asp) for short biographies of Bob Regan, the opening keynote speaker on Wednesday, Gordon Smillie, the closing keynote speaker on Thursday, and Hiroshi Ishii, the closing keynote speaker on Friday.

Andrew Pinder was appointed the Government's e-Envoy on 31st January 2001 following three months as acting e-Envoy. Andrew reports directly to the Prime Minister and works alongside the e-Minister, Patricia Hewitt, who has overall responsibility for the Government's e-agenda.

As e-Envoy, Andrew is leading the drive to get the UK online, ensuring that the country, its citizens and businesses derive the maximum benefit from the knowledge economy. He co-ordinates the government strategy, ensuring e-access and training, galvanising UK business and driving the e-agenda through government.

The UK online initiative, which Andrew leads, is a partnership between government, industry, the voluntary sector, trade unions, and consumer groups, to make the UK one of the world's leading knowledge economies.

Andrew Pinder has a long and distinguished career in both the private and public sectors. After 18 years in the Inland Revenue, where he became Director of IT, Andrew moved to the private sector, becoming Director of Operations and Technology at Prudential Corporation, before joining Citibank Investment Bank as head of European Operations and Technology.

After performing other roles in Citibank, including spells in New York, continental Europe and Dublin, Andrew left the bank in 1999.

Prior to his appointment as e-Envoy in 2001, he was engaged in a number of new technology-related start-ups and, as a partner, in a small venture capital firm, as well as carrying out a number of management consultancy assignments for the Government.

In his spare time Andrew enjoys walking, music, gardening and fly-fishing.

## Conference Social Programme

On Thursday evening, all conference delegates are invited to attend the conference dinner, which commences at 7.30pm in the historic Roman Baths and Pump Room in Bath (*www.romanbaths.co.uk*). Also, on Wednesday evening, there is an informal social event from 7pm in Bath.

| | | 8W 2.20 | 8W 2.22 | 8W 2.34 | 8W 2.23 | 8W 2.29 | 8W 2.24 |
|---|---|---|---|---|---|---|---|
| Monday 8th | 09:30–13:00 | | T2 | T3 | T4 | W1 | W2 |
| | 13:00–14:30 | Lunch – Choices Restaurant | | | | | |
| | 14:30–18:00 | T1 | T2 | T3 | T4 | W1 | W2 |
| | | 8W 2.27 | 8W 2.34 | 8W 2.24 | 8W 2.10 | 8W 2.20 | 8W 2.29 |
| Tuesday 9th | 09:30–13:00 | T5 | T6 | T7 | T8 | T9 | W6 |
| | 13:00–14:30 | Lunch – Choices Restaurant | | | | | |
| | 14:30–18:00 | T5 | T6 | T7 | T8 | T9 | W6 |
| | 19:00–21:00 | | | | | | |
| Thursday 11th | 13.00–14.00 | | | | | | |
| Friday 12th | 13.00 onwards | | | | | | |

Refreshments are provided on Monday and Tuesday from 11:00–11:30 and 16:00–16:30 in Room 8W 2.28

| | | TRACK 1<br>University Hall | TRACK 2<br>8W 2.1 | TRACK 3<br>8W 1.1 |
|---|---|---|---|---|
| Wednesday 10th | 09:45–10:15 | HCI 2003 Opening Ceremony | | |
| | 10:15–11:00 | Opening keynote: Bob Regan, Macromedia and W3C | | |
| | 11:00–11:30 | | | |
| | 11:30–13:00 | | Session 1: Doing the Right Thing in the Right Place | Session 2: Accessibility |
| | 13:00–14:30 | | | |
| | 14:30–16:00 | | Session 4: Emotions and Computers | Session 5: Designing for the Ages |
| | 16:00–16:30 | | | |
| | 16:30–18:15 | | Session 6: Information Retrieval | Laboratory & Organizational Overviews Session |
| | 18:15–19:00 | British HCI Group AGM | | |
| | 19:00–late | | | |
| Thursday 11th | 09:45–10:00 | Industry Day Opening | | |
| | 10:00–11:00 | Industry Day keynote: Andrew Pinder, UK Government E-envoy | | |
| | 11:00–11:30 | | | |
| | 11:30–13:00 | | ID Session 1: Introducing HCI to Industry | ID Session 2: Putting HCI to Work |
| | 13:00–14:30 | | | |
| | 14:30–16:00 | | ID Session 3: E-Commerce | ID Session 4: Designing for and Evaluating Usability |
| | 16:00–16:30 | | | |
| | 16:30–17:30 | Industry Day keynote: Gordon Smillie, Microsoft | | |
| | 17:30–19:00 | | | |
| | 19:00–22:30 | | | |
| Friday 12th | 09:30–11:00 | Session 8: Looking Ahead | Session 9: Interaction Techniques | Session 10: Design Methods and Principles |
| | 11:00–11:30 | | | |
| | 11:30–12:30 | Closing keynote: Hiroshi Ishii, MIT Media Lab | | |
| | 12:30–13:00 | HCI 2003 Closing Ceremony | | |

| | | | | | |
|---|---|---|---|---|---|
| 8W 2.10 | 8W 2.27 | 8W 2.21 | 8W 2.13 | Claverton Rooms/SCR | Claverton Rooms/SCR |
| W3 | W4 | W5 | | | |
| W3 | W4 | W5 | Doctoral Consortium | | Communications Group |
| 8W 2.21 | 8W 2.22 | 8W 2.23 | 8W 2.13 | | |
| W7 | W8 | HEW | Doctoral Consortium | | |
| W7 | W8 | HEW | Doctoral Consortium | | Events Group, 3E4.17 (to 16:00), 3E4.19 (from 16:30) |
| | | | | Welcome Reception | British HCI Group Exec Volunteers' Reception |
| | | | | | Student Rep meeting |
| | | | | Research Group | Education & Practice Group |

| TRACK 4<br>5W 2.3 | TRACK 5<br>8W 2.23, 2.20, 2.10 | TRACK 6<br>Marquee | TRACK 7<br>Claverton Rooms | TRACK 8<br>Central Bath |
|---|---|---|---|---|
| | | | | |
| | | Exhibition & Refreshments | | |
| Session 3: Evaluation Methods | Posters & Interactive Experiences 1 | | | |
| | | Exhibition & Lunch | | |
| Panel Session 1: Exposing, Exploring, Exploding Task Analysis Myths | Posters & Interactive Experiences 2 | | | |
| | | Exhibition & Refreshments | | |
| Session 7: Mobile Interaction | Posters & Interactive Experiences 3 | | | |
| | | | | |
| | | | | Informal Social Event |
| | | | | |
| | | Exhibition & Refreshments | | |
| Panel Session 2: Ethnography In Organizations | Posters & Interactive Experiences 4 | | | |
| | | Exhibition & Lunch | | |
| Panel Session 3: iTV meets Mobile Communications | Posters & Interactive Experiences 5 | | | |
| | | Exhibition & Refreshments | | |
| | | | | |
| | | | InterACTIVE #7 – HCI: a competitive advantage. A knowledge transfer surgery bringing HCI to industry. | |
| | | | | Conference Dinner |
| Panel Session 4: Grand Research Challenges | Posters & Interactive Experiences 6 | | | |
| | | Exhibition & Refreshments | | |
| | | | | |

## Monday–Tuesday

Doctoral Consortium

**Designing user-friendly search engine interfaces for the world wide web**

*web search engines, user interfaces, user groups*

*Anne Aula (Finland)*

Describes research that aims at understanding information search behaviour of different user groups using web search engines. Additionally, describes user interface solutions for helping users in information search.

**Emotional access: user preferences for emotional interaction in computing**

*affective, human–computer interaction, emotion recognition*

*Lesley Axelrod (UK)*

Multi-modal systems are developing to recognise human emotions, but are still only prototypes. User behaviour and user preferences with emotion recognition systems can be analysed using Wizard of Oz techniques.

**Adaptive decision making in menu search: the role of interdependence and past experience on link selection**

*visual search, menu search, cognitive modelling, web design, world wide web, usability, eye-tracking*

*Duncan Brumby (UK)*

Whether people choose to assess a label on a web page is dependent on the relevance of all other items so far assessed, not just the best so far.

**Towards a localised experience of technology: a proposal to enhance interaction design for ubiquitous computing systems**

*interaction design, ubiquitous technologies, space and place, localised experience*

*Luigina Ciolfi (Ireland)*

Focuses on the enhancement of the ID process for the design and development of ubiquitous technologies by extending the existing set of concerns related to the design of spatially distributed systems.

**Using interaction style to develop user interfaces for multiple devices**

*ubiquitous, user interfaces, interaction styles, generation.*

*Steve Gilroy (UK)*

This paper proposes interaction style as an abstraction to aid implementation of user interfaces across devices with differing interface characteristics. A prototype system, SIS, that utilises style abstractions is presented.

**Human–system interaction in critical response systems**

*critical decision method, ambulance command and control, cognitive engineering*

*Jared Hayes (NZ)*

Discussed in this paper is proposed work, which has the overall goal of developing display designs that complement the decision-making processes of ambulance dispatchers.

**Empirical studies on websites: user preferences, attractiveness and memorability**

*websites, design features, attractiveness, attitude, user preferences, memorability*

*Murni Mahmud (UK)*

Attractive design features on websites can draw users' attention, motivate and persuade them to buy. This research explores how to develop a set of heuristics for designing attractive websites.

**Multitasking in a mobile context**

*mobile context, multitasking, attention, interruptions*

*Stacey Nagata (Netherlands)*

Handheld internet computing requires user interaction design for multitasking. Investigating user anticipation and origin of interruptions suggested that mediating interruptions and directing attention could support user web performance on a handheld.

**Improving usability of e-commerce sites by tracking eye movements**

*e-commerce, usability evaluation techniques, eye movements, eye tracking, customer's expectations, visual search*

*Ekaterina Tzanidou (UK)*

We are applying eye tracking as a complementary usability evaluation technique for developing guidelines for the design of e-commerce sites. Eye tracking provides insight into users' cognitive processes, and their strategies of visual attention and searching.

**A study of familiarity**

*HCI, familiarity, Heidegger, Zhuang-zi*

*Guy Van de Walle (UK)*

Empirically-based, this research investigates the relevancy of Heidegger and Zhuang-zi's analyses of familiarity and the familiarisation process and the need to overcome the opposition subject-object to understand the relation human–computer.

**A practice-based investigation into the integration of digital technologies within contemporary jewellery**

*digital technologies, emotions, contemporary jewellery, interpersonal communication, memories, enchantment, personal significance*

*Jayne Wallace (UK)*

Practice driven research using the methods and perspective of a contemporary jeweller, concerned with enhancing intimate emotional communication between individuals through the conception, design and use of digital jewellery objects.

**Computer support for a person's cognitive map in a navigational domain**

*navigational technologies, cognitive mapping, distributed cognition, grounded theory*

*Judy Wilson (UK)*

Researching the potential for technological support of human cognitive mapping facilities in a navigational setting. Initially analysing the potential for conflict and resulting dilemmas when using current supporting artefacts.

Monday Tutorial T1

**Using design space analysis to facilitate more effective interaction design meetings (half day)**

*Paul Englefield (UK)*

Interaction design meetings can be tough to attend and tougher to facilitate. This tutorial presents practical facilitation techniques using design space analysis to provide structure and promote creativity and rigour.

Monday Tutorial T2

**Who needs this technology, and why? New ways of discovering applications and estimating benefits (full day)**

*William Newman (UK)*

Innovators in R&D and user organizations will learn advanced diary-study methods for identifying applications and modelling their performance, making possible systems that solve real user problems and deliver measurable benefits.

Monday Tutorial T3

**Phone usability testing – getting high quality feedback on prototypes or web sites (full day)**

*Julie Ratner & Anne-Laure Negri (US/France)*

Add another testing method to your toolbox; learn the pros and cons of phone usability method. Complete five exercises to master this synchronous remote data collection method.

Monday Tutorial T4

**The art of seeing: practical observation methods for software development (full day)**

*Susan M. Dray / David A. Siegel (US)*

Naturalistic observation uncovers information about users and their behavior that you cannot possibly learn in the usability lab. This tutorial provides a hands-on, practical introduction to observational methods for learning about users in context.

Tuesday Tutorial T5

**Systemic task analysis (full day)**

*Dan Diaper (UK)*

Fundamental to HCI, task analysis concerns work performance. STA's an understandable approach to task analysis. STA is scaleable and usable anywhere in the software lifecycle within most software engineering methods.

Tuesday Tutorial T6

**Creating highly satisfying user experiences using a methodical software engineering approach**

*Product design, UML*

*Dave Roberts and Claire Paddison (UK)*

Creating a compelling user experience involves understanding users, their goals, tasks, and expectations. This tutorial teaches a design approach based on a UML model to foster a rigorous process.

Tuesday Tutorial T7

**Information visualization (full day)**

*Robert Spence (UK)*

Your database may conceal valuable information that you could discover simply by viewing a graphical representation of that data. That is what information visualization is about: and it works!

Tuesday Tutorial T8

**Working with and analyzing qualitative data (full day)**

*David A. Siegel / Susan M. Dray (US)*

Learn how to ensure that findings from field user studies are valid and truly useful in design, while avoiding drowning in your data. We will teach strategies and tools to maintain focus, archive data, and explore data rigorously.

Tuesday Tutorial T9

**Setting usability performance requirements (full day)**

*Nigel Bevan (UK)*

How to set usability performance requirements based on effectiveness, efficiency and satisfaction, which can be measured once a prototype is available. Includes practical examples of how the approach has been implemented in industry.

Workshop Monday W1

**Decision-making among HCI researchers**

*Ray Adams and Patrick Langdon (UK)*

The workshop is intended to work towards a model of the decision-making processes in the conduct of HCI research, incorporating a repertoire of methods and critical obstacles to overcome.

Workshop Monday W2

**Benefits management and HCI – delivering value to users through IT**

*Jarnail Chudge and Colin Ashurst (UK)*

The workshop will explore value and benefits in managing the delivery of IT solutions, such as return on investment and total cost of ownership, with the aim of exploring the relationship between HCI and Benefits Management.

Workshop Monday W3

**Designing for civil society**

*Andy Dearden & Steve Walker (UK)*

The workshop will explore how existing knowledge of human–computer interaction can be applied by advocacy and interest groups in society, and what questions such groups pose for our emerging understanding of HCI.

Workshop Monday W4

**Improving the accessibility of distance learning**

*Tony Stockman (UK)*

The workshop is intended to improve support for the cognitive, communication and collaborative processes that are central to the effective use of DL environments, based on current practice and new opportunities.

Workshop Monday W5

**The temporal aspects of tasks**

*Peter Wild, Peter Johnson & Chris Roast (UK)*

The workshop will explore the implications for interactive system design of examining the higher-level temporal structure of tasks, drawing on cognitive and social models and theories of computer use.

Workshop Tuesday W6

**Metaphor and HCI**

*Dr Mark Treglown (UK)*

The workshop will address the use of metaphor in interactive system design, especially for emerging user interface media and modalities, with the intention of establishing new challenges for HCI.

Workshop Tuesday W7

**Genres, use qualities, and interactive artifacts**

*Jonas Lundberg, Mattias Arvola & Stefan Holmlid (Sweden)*

The workshop will explore the idea of genres as knowledge structures constituted of the use qualities of artefacts, to consider reuse in HCI design.

Workshop Tuesday W8

**Accessibility issues for interactive television**

*Lyn Pemberton, Judith Masthoff, Richard Griffiths, Owen Daly-Jones, Deborah Fels (UK/Canada)*

The users of interactive television (iTV) include many elderly viewers and people with motor and/or perceptual disabilities, for whom current services are often not usable. This workshop aims to develop an accessibility research agenda for iTV.

Workshop: HCI Educators

**Making learning standards invisible**

*Learning standards, reusable learning objects, HCI, SCORM, IMS, OKI*

*John Rosbottom, Jonathon Crellin, Shailey Minocha, Tom McEwan, Barbara McManus (UK)*

The workshop considers the role of learning standards from an HCI perspective. We aim to produce prototype reusable HCI learning objects and a "white paper" to identify how learning standards may be embedded in end-user software

## Wednesday 10:15

Opening Keynote *University Hall*

**Provisional subject: Accessibility research**

*accessibility*

*Bob Regan, Macromedia & W3C*

Bob Regan is the Senior Product Manager for accessibility at Macromedia. In that role, he works with designers, developers and engineers from around the world to communicate existing strategies for accessibility as well as develop new strategies. He works with engineers and designers within Macromedia to develop new techniques and improve the accessibility of Macromedia tools.

## Wednesday 11:30

***Session 1: Doing the right thing in the right place***

*Track 2 (Room 8W 2.1)*

Full Paper

**The character of actions for computers in co-located collaboration**

*Mattias Arvola*

This paper describes the Interaction Character in three settings of co-present computer usage, revealing a constant flux of actions. These observations may contest the prevalent focus of interaction design.

Full Paper

**Two phenomenological studies of place**

*Phil Turner & Susan Turner (UK)*

We report two 'benchmarking' studies of real places. The benchmarking, which is phenomenological in character, will be used to inform and guide the evaluation of photorealistic, virtual re-creations of places

Full Paper

**Understanding task grouping strategies**

*Peter Wild, Peter Johnson & Hilary Johnson (UK)*

This paper applies and extends TKS to the issue of people performing multiple, distinct tasks in varying contexts. One of the findings generated by the studies reported was the grouping of tasks by some contextual factors such as location, participant deadline. The implications are examined.

## Wednesday 11:30

***Session 2: Accessibility***

*Track 3 (Room 8W 1.1)*

Full Paper

**Two falls out of three in the automated accessibility assessment of world wide web sites: A-Prompt v. Bobby**

*Dan Diaper & Linzy Worman (UK)*

The relative performance of two web accessibility assessment tools is compared. The results represent a shot-across-the-bows to developers and to organisations who may rely on such tools.

Full Paper

**WebTouch: an audio-tactile browser for visually handicapped people**

*M. Macías, A. Reinoso, J.L. García, J. González, J.C. Díaz & F. Sánchez*

This paper presents WebTouch, a multimodal web browser with two modalities for surfing the net: voice and tactile skills. Our contributions are the Automatic Speech Recognition System and a mouse able to recognise the elements in the page.

Short paper

**Computer based support for learning facial expressions**

*User interface design, computer based learning, autism, experimental evaluation*

*Aisa Brooker, Nick Bryan-Kinns (UK)*

This paper reports on an experimental comparison of a conventional approach and a novel virtual pet based approach to supporting autistic people learning facial expressions using computers.

Short Paper

**The Synface project: development and evaluation of a talking face telephone**

*automatic speech recognition, usability, telephone, lip reading, hard of hearing, avatar*

*Mary Sheard and Neil Thomas (UK)*

Synface is a European collaborative research project, developing a lipspeaking avatar as an aid to telephone communication for hard of hearing people. The ongoing user evaluation work is reported here.

## Wednesday 11:30

***Session 3: Evaluation Methods***

*Track 4 (Room 5W 2.3)*

Full Paper

**Changing analysts' tunes: the surprising impact of a new instrument for usability inspection method assessment**

*Alan Woolrych, Gilbert Cockton, Lynne Hall & Mark Hindmarch (UK)*

An extended report format developed for research purposes improves analyst performance with heuristic evaluation by reducing the number of false alarms and greatly improving the quality of heuristic application.

Full Paper

**Ontological sketch modelling: highlighting user-system misfits**

*ontological sketch modelling, usability evaluation, conceptual models, misfits, drawing application, digital music library*

*Iain Connell, Thomas R. G. Green & Ann E. Blandford (UK)*

Misfits between a user's conceptual model and that built into a system cause various user difficulties. Ontological Sketch Modelling (OSM) is an approach to evaluating the quality of fit.

Short Paper

**Hermes: a navigation aid for city tourists**

*navigation, city tourists, user-centred design.*

*Arno van de Camp, Judith van der Kooij (Netherlands)*

This paper addresses the iterative development and evaluation of a navigation device for city tourists. The emphasis is on user requirements, design and evaluation.

Short Paper

**Future telecommunications: exploring methods**

*HCI, multimodal, mobile usability, pervasive computing, action scenarios, and interaction design*

*Lynne Baillie (Austria)*

The paper reports on the evaluation of a multimodal route finder application and posits the question: can human–computer interaction methods be easily adapted to evaluate new mobile applications and services?

## Wednesday–Friday

***Posters and Interactive Experiences***

*Track 5 (Room 8W 2.23,2.20, 2.10)*

Poster

**A web based tool for HCI-orientated massively asynchronous linear card sorting**

*Card sorting, online tool, taxonomies, categories, Java*

*D. Mohamedally, P. Zaphiris & H. Petrie (UK)*

A tool is presented for use in knowledge elicitation from demographic groups so as to allow large numbers of participants to take part asynchronously in card sorting experiments via the web.

Poster

**Bringing the user into the design process – incorporating user context into HCI patterns**

*static and dynamic context, HCI design patterns, user interface design, customisability*

*Judy van Biljon & Karen Renaud (South Africa/UK)*

This poster explores the inclusion of context in HCI design patterns. Similarities between pattern identification and context derivation are noted. Examples of context inclusion in HCI design patterns are presented.

Poster

**Development of dementia diagnosis and treatment system in a virtual reality environment**

*dementia, VR*

*Yongwan Kim, Kisuk Lee, Jinsung Choi (Korea)*

Dementia is a global cognitive syndrome caused by diseases acquired in adulthood. This paper suggests VR systems which allow the elderly with mild-dementia to diagnosis their conditions and treat their cognitive problem.

Poster

**The evolution of mass communication in the interactive world**

*mass media, communication, HCI, conversation, design, dialogue.*

*P. Broadbent, N. Bryan-Kinns, M. Chong, A. Cooper, M. Hurst, N. Lewis, A. Light, N. Macdonald, D. Reed, A. C. Roibás, G. Rollestone, R. Sala, L. Skrebowski, L. Weitzman, L. Wood, & A. Zolli (UK)*

This poster begins to map out the current state of mass communication, provides insight into how it may evolve in the future, and outlines how we may support such evolutions.

Poster

**Drawing and gesture to support interaction**

*Communication, drawing, gesture.*

*C. Peters, & P. G. T. Healey (UK)*

An experimental study of drawing in cross-linguistic interaction. The results indicate that drawing is utilised when drawing tools are readily available and the relationship between gesture and drawing is discussed.

Poster

**Reconfiguring the rose – a virtual reality rose window celebrating the feminine**

*artists' collaboration, internet-based, virtual reality rose window, stained glass, digital media*

*Delia Whitbread (UK)*

This paper describes a PhD project using IT to compile an artwork that will represent disparate cultural images in a virtual framework replacing the confines of the studio with new technology.

Poster

**Enabling people with aphasia to access the internet: breaking down the barriers**

*internet, accessibility, communication disorders, aphasia*

*Brian Petheram, Susie Parr, James Newbery, and Becky Moss (UK)*

People with communication disorders were involved in a project which explores their internet accessibilty issues. They were facilitated in designing a website (www.aphasiahelp.org) for themselves, including their own personal pages.

Poster

**Adapting to evolving needs: evaluating a behaviour-based search interface**

*evaluation, adaptive search systems*

*R.W. White, J.M. Jose, & I. Ruthven (UK)*

Evaluation of a behaviour-based adaptive search interface that predicts the current state of a user's information need based on their interaction

Interactive Experience

**Digital way to draw**

*Digital drawing, computer-assisted sketching, interaction technique, pen-based computing, user-interface design.*

*B. Champoux, J.-B. Martens, S. Subramanian and D. Aliakseyeu (Netherlands)*

With the Visual Interaction Platform (VIP), gesture and sketching are not obstructed by technology and the user can focus on the task. VIP technology components, current developments and future direction are presented.

Interactive Experience

**d-touch: a consumer grade tangible interface module and musical applications**

*tangible user interfaces, augmented reality, consumer grade hardware, musical applications*

*E. Costanza, S. B. Shelley, J. Robinson (UK)*

"d-touch" uses a consumer-grade web camera and customizable block objects to provide an interactive tangible interface for a variety of applications. Two new, flexible music performance applications demonstrate the system.

Interactive Experience

**Experiencing extrovert gadgets**

*ubiquitous computing, end-user programming, component architecture, GAS architectural style.*

*I.Mavromatti, P.Markopoulos, AJ.Calemis,A.Kameas (Greece/ Netherlands)*

This paper discusses technologies that aim to enable end-users to realize, modify and personalise ubiquitous computing applications. A concept demonstrator and a formative evaluation are discussed.

Interactive Experience

**Freeform: a tool for sketching form designs**

*sketching, interface design tools, informal design*

*Beryl Plimmer and Mark Apperley (NZ)*

Freeform is a tool for hand-sketching user interfaces on a digital whiteboard. It is integrated into a programming IDE so that novice programmers can create informal low-fidelity prototypes then translate these into formal designs.

Interactive Experience

**Learning about universal access**

*accessibility, universal access, HCI education and practice*

*Tom McEwan, Sandy Anderson, Chris Batholomew, Peter Clarke, Alan Morrison (UK)*

An interactive account of a group of postgraduates learning about the tensions between universal access and usability, creating a socially useful website for a voluntary organisation

Interactive Experience

**The Reality Helmet**

*reality, synaesthesia, presence, embodiment, wearable.*

*J. Waterworth and D. Fällman (Sweden)*

The Reality Helmet is a wearable device providing a novel form of interactive experience, in which environmental sounds are presented to the wearer as vision and sights are turned into a soundscape.

## Wednesday 14:30

***Session 4: Emotions and Computers*** *Track 2 (Room 8W 2.1)*

Full Paper

**Expressive image generator for an emotion extraction engine**

*A.C. Boucouvalas, Zhe Xu & D. John (UK)*

A new method of generating expressive images from a neutral image is presented. The software and experiments testing effectiveness are described. Contributes to the development of real-time expressive communication systems.

Full Paper

**An exploration of facial expression tracking in affective HCI**

*Robert Ward, Dennise Bell & Phil Marsden (UK)*

Investigates the capabilities of facial movement tracking software in detecting reactions to events and content. Finds it potentially viable. Reflects upon the role of facial expression in future HCI.

Short Paper

**Affective agents to reduce user frustration: the role of agent embodiment**

*affective computing, frustration, emotion*

*Kate Hone (UK)*

The paper describes two experiments that aim to investigate agents that respond to user frustration. The results provide some empirical insight into the utility of affective agents.

Short Paper

**A preliminary evaluation of the usability of a human computer debate dialogue model**

*computational dialectics, human computer debate, dialogue model, heuristic evaluation*

*Tangming Yuan (UK)*

This paper reports the design and implementation of a human computer debate prototype and a preliminary evaluation of the usability of the underlying dialogue model.

## Wednesday 14:30

***Session 5: Designing for the Ages*** *Track 3 (Room 8W 1.1)*

Full Paper

**Fancy graphics can deter older users: a comparison of two interfaces for exploring healthy lifestyle options**

*Patricia Wright, Steve Belt & Chris John*

Rather than offering advice, decision aids can encourage people to explore options and consequences. Observing "Decision Explorers" showed exploration varied with interface philosophy, highlighting the thistledown texture of people's decision-making.

Full Paper

**Towards VoiceXML dialogue design for older adults**

*Mary Zajicek, Richard Wales & Andrew Lee (UK)*

This paper uses the experience of tutors teaching older adults, to inform the design of a speech based VoiceXML system enabling older adults to access the Web without a computer.

Short Paper

**Older adults' use of computers: a survey**

*older people, survey, computer use, interaction design*

*Joy Goodman, Audrey Syme and Roos Eisma (UK)*

This paper reports on a questionnaire and interview survey of computer use and ownership with 353 participants over 50, and discusses the implications of the results for design and marketing.

Short Paper

**A comparison of two on-line handwriting recognition methods for unconstrained text entry by children**

*handwriting recognition, children, usability, text input*

*Janet Read (UK)*

A small study on the use of handwriting recognition for text entry with child users. Real time and batch recognition were compared, and measures of preference, effectiveness and efficiency are presented.

## Wednesday 14:30

***Panel Session 1***

*Track 4 (Room 5W 2.3)*

**Exposing, exploring, exploding task analysis myths**

*human–computer interaction (HCI), software engineering, tasks, task analysis, methods*

*Dan Diaper, Jon May, Gilbert Cockton, Susan Dray, David Benyon, Nigel Bevan, Tom McEwan (UK/US)*

Many beliefs about task analysis are false. Some may once have been true, some are occasionally true and some were never true. The audience and panel will suggest, discuss and evaluate the myths about task analysis.

## Wednesday 16:30

***Session 6: Information Retrieval***

*Track 2 (Room 8W 2.1)*

Full Paper

**Look or listen: discovering effective techniques for accessing speech data**

*Steve Whittaker & Julia Hirschberg*

This laboratory evaluation compares 3 different interfaces for accessing archival speech data. The results contradicted our expectations but suggested promising avenues to explore in designing novel UIs to speech data.

Full Paper

**Evaluation of a prototype interface for structured document retrieval**

*Jane Reid & Mark D. Dunlop*

This paper presents a prototype interface (the RelevanceLinkBar) for structured document retrieval as well as an experimental study which aims at assessing complementary aspects of this prototype. The results show that RelevanceLinkBar is preferred over standard search engines' listed ranking.

Full Paper

**How knowledge workers gather information from the web: implications for peer-to-peer file sharing tools**

*Jennifer Hyams & Abigail Sellen*

A study of how knowledge workers gather information from the web. Shows that knowledge workers' PCs are more usefully viewed as "workbenches" than as information databases of shareable information.

Short Paper

**The effects of scannability on information search: an online experiment**

*scanning, information search, on-screen reading*

*Michael Kickmeier (Austria)*

Scanning on-screen contents is an important cognitive and behavioural concept. This study investigates the role of the density of highlighted items in the visual field on search accuracy and speed.

## Wednesday 16:30

***Lab and Organisational Overviews Session*** *Track 3 (Room 8W 1.1)*

Organisational Overview

**Pacific Northwest National Laboratory in Washington**

*Andrew J. Cowell (US)*

The Rich Interaction Environments team from PNNL/Battelle is tasked with developing innovative technologies to answer problems posed by our academic, government and industrial clients. We'll demonstrate some of our most novel solutions.

Organisational Overview

**Nomensa – Humanising technology for effective e-business**

*David Ellender*

Organisational Overview

**VIVID Research Centre at the Department of Information Systems and Computing at Brunel University**

*Kate Hone (UK)*

The VIVID Research Centre at Brunel University brings together HCI researchers with a broad range of expertise and interests. This presentation reviews current practice and invites academic and industrial collaboration.

Organisational Overview

**User-Lab – Birmingham Institute of Art & Design at University of Central England**

*Marie Jefsioutine (UK)*

User-Lab, part of Birmingham Institute of Art and Design's research department, delivers income-generating commercial services and research and development focused on understanding the user experience, usability, accessibility and engagability.

Organisational Overview
**Middlesex University Interaction Design Centre**
*Paul Curzon (UK)*
IDC focuses on the theoretically grounded evaluation of interactive systems, using areas such as digital libraries, distributed cognitive systems and design-for-all as complex exemplars to test evaluation techniques

Organisational Overview
**Computer-Human Interaction Research Group at The Open University**
*Simon Holland (UK)*

Organisational Overview
**Channelling expertise from Napier's HCI group – human-centred knowledge transfer**
*Expertise transfer, knowledge transfer, learning organisations, HCI in practice*
*Tom McEwan, David Benyon, Susan Turner (UK)*
"Third Stream" funding for universities needs careful channelling. This overview examines issues in transferring HCI knowledge, or more accurately expertise, to industrial partners, based on recent government-funded programmes

## Wednesday 16:30

***Session 7: Mobile Interaction*** *Track 4 (Room 5W 2.3)*

Full Paper
**MovieLens Unplugged: Experiences with a Recommender System on Four Mobile Devices**
*Brad Miller, Istvan Albert, Shyong Lam, Joe Konstan & John Riedl (US)*
This paper presents a practical study of a user interface for a recommender system on an occasionally connected palmtop, a wireless palmtop, a cell phone, and a voice only phone interface.

Full Paper
**Effective Web Searching on Mobile Devices**
*Kerry Rodden, Alan Blackwell, Natasa Milic-Frayling & Ralph Sommerer*
Describes a technique for representing Web pages on small screens, where a page overview is annotated to show positions of search terms. Discusses the results of a controlled experimental evaluation.

Full Paper
**M-RSVP: Mobile Web Browsing on a PDA**
*Oscar de Bruijn & Chieh Hao Tong*
This paper presents the use of a flexible device-independent specification format for web content that can be displayed on small screens, like handhelds. An interaction model for a browser (called RSVP browser) to be used on handheld devices is described, evaluated and compared to Pocket IE

Short Paper
**SkeChit: a sketching and numerical interface for pdas**
*Sketching, number manipulation, cultural accessibility*
*Swami Manohar, Anirudh Moudgal, V. Vinay, P.R. Subrahmanya (India)*
Input methods on PDAs make them cumbersome for many obvious and common tasks. A user-interface informed by observations of everyday use of paper artifacts and is proposed

## Thursday 10:00

Keynote Thursday am
*Andrew Pinder, UK Government E-envoy (UK)*

## Thursday 11:30

***ID Session 1: Introducing HCI to industry*** *Track 2 (Room 8W 2.1)*

Industry Day Presentation
**Introduction to the history of HCI and standards**
*Steve Cummaford & Nigel Bevan (UK)*
Usability has come a long way since its academic origins. The principles are now enshrined in international standards and applying usability methods can improve profitability in almost every business situation.

Industry Day Presentation
**Introducing UCD into your design team**
*Giles Colborne (UK)*
Anyone trying to introduce user centred design to their organisation must rise above the resistance to change, the office politics and the confusing welter of tools and methods. The Director of Customer Experience for Euro RSCG Circle and President of the UK Usability Professionals Association shows you how to transform your design team without starting a civil war.

Industry Day Presentation
**Mental Models, Metaphor and Design**
*William Hudson (UK)*
William Hudson introduces the theory of mental models and metaphor then goes on to look in detail at their practical application in designing and improving interactive systems. Examples are drawn from e-commerce (the shopping basket metaphor), desktop applications and e-banking.

## Thursday 11:30

***ID Session 2: Putting HCI to Work*** *Track 3 (Room 8W 1.1)*

Full Paper
**A Directional Stroke Recognition Technique for Mobile Interaction in a Pervasive Computing World**
*Vassilis Kostakos & Eamonn O'Neill (UK)*
This paper presents a pervasive computing interface that can be used by anyone, anywhere, on any device. We describe a novel input method, using new techniques to handle familiar gestures.

Short Paper
**Designing for a pervasive information environment: the importance of information architecture**
*Customer-Centered Design, Information Architecture, Environmental User Interface Design, Pervasive Information Environments, Personas, Public Library*
*Heather McQuaid & Aradhana Goel (US)*
As information flows through devices and spaces, it's vital to have an information architecture that provides a more structured customer experience. Discover how we designed for a pervasive information environment

Short Paper
**An Activity Theory Approach to Technology Use in Public Areas: The Case of the ATM**
*Activity Theory, ATMs, Public Areas, Technology.*
*Linda Little, Pam Briggs, Lynne Coventry (UK)*
This study used an Activity Theory Approach aimed at further understanding the problems that influence the use of technologies in public areas, in this case an automated teller machine (ATM).

Short Paper
**Using a combination of sound and images to authenticate web users**
*User Authentication, Associative Memory, Memorability, Sound and Image*
*Jim Liddell, Karen V. Renaud & Antonella De Angeli (UK)*
The paper explores a mechanism for web-based authentication based on a combination of sound and images - exploiting users' associative memory strengths. Results of two evaluation studies are presented and conclusions drawn

Short Paper
**Exploiting innate rhythmic sense in a ringtone composer**
*Music Interface, Rhythm, Natural Interaction, TapTone, Mobile Phone Ringtones*
*Paul A Cairns & Daniel Lock (UK)*
Rhythm is natural. Making ringtones via rhythm appeals to users.

## Thursday 11:30

***Panel Session 2*** *Track 4 (Room 5W 2.3)*

**Ethnography in Organizations: Exploring questions of Validity and Value**
*Ethnography, Anthropology, Human-Computer Interaction, Software Development*
*Susan Dray, Anne Cohen Kiel, David A. Siegel, Christian Sturm, Nigel Thrift, Dennis Wixon (US)*
This panel is intended to provoke lively debate about the value and validity of ethnographic studies as done in industry by presenting case studies and critiquing them from business and academic perspectives.

## Thursday 14:30

***ID Session 3: E-Commerce*** *Track 2 (Room 8W 2.1)*

Full Paper
**Social and Cultural Obstacles to the (B2C) E-Commerce Experience**
*Liisa Dawson, Shailey Minocha & Marian Petre (UK)*
This paper reports cross-disciplinary research in Customer Relationship Management (CRM) and HCI. We show that in addition to the usability criteria, CRM heuristics should be integrated into the design of E-Commerce for customer retention, trust, and loyalty.

Full Paper
**Trust at First Sight? A Test of Users' Ability to Identify Trustworthy e-Commerce Sites**
*Jens Riegelsberger, Angela Sasse & John D. McCarthy*
Investigates how users judge the trustworthiness of a website. Combines eye-tracking and methods from experimental economics to find effects of employee photos on trust and usability. Results show that users need to explore a site in detail to reach correct trust decisions.

Industry Day Presentation
**Forms that work.**
*Caroline Jarrett (UK)*
Forms are everywhere - so why are there so many bad ones? Caroline will describe her 'Three layer model' of forms and how you can apply it to design good forms.

## Thursday 14:30

***ID Session 4: Designing for and Evaluating Usability*** *Track 3 (Room 8W 1.1)*

Short Paper
**Understanding interaction traps**
*Usability; Dissonant models; User experience, Interaction trap; Interaction barrier*
*Ann Blandford, Harold Thimbleby & Nick Bryan-Kinns (UK)*
Users fall into interaction traps when a system misleads them about what is achievable. Interaction traps degrade potentially fruitful interactions into inefficient or failed ones. Most can be designed out.

Industry Day Presentation
**HEDB: A software tool to support Heuristic Evaluation**
*Heuristic evaluation, inspection, tools, practice*
*Paul Englefield, IBM (UK)*
The HEDB is a software tool to support efficient and rigorous practice of Heuristic Evaluation. It addresses concerns identified in commercial practice and has been well received by practitioners.

Industry Day Presentation
**UsabilityNews Accessibility Project: Making a web site accessible "after" it is live**
*Dave Clarke, Ann Light, & Claire Paddison (UK)*
Project investigated the accessibility of UsabilityNews.com. Consisting of a survey, an accessibility heuristic evaluation and user testing, its aim was to see if the site could be made accessible with minimum effort.

## Thursday 14:30

***Panel Session 3*** *Track 4 (Room 5W 2.3)*

**Ubiquitous media at the intersection: iTV meets Mobile Communications**
*iTV, ubiquitous broadcasting, HCI, future media,interactive multimedia, mobile devices.*
*Anxo Cereijo Roibás, Glorianna Davenport, Peter Olaf Looms, Marc GoodChild, Akseli Anttila, Sepideh Chakaveh, Célia Maria Silvério Quico, John Kelly, Manuela Brandao*
It will stimulate discussion around

the design of HCI for ubiquitous broadcasting of interactive multimedia content (e.g.handhelds as interfaces for the iTV experience), creating a provocative framework for future media communications.

## Thursday 16:30

Keynote Thursday pm, *University Hall*

**Provisional subject: Usability & the tablet PC**

*tablet PC, usability*

*Gordon Smillie, Microsoft*

Gordon is the Group Director for Microsoft's enterprise customers across all verticals, partners and consultancies. He has been a member of the Microsoft UK Executive for over three years and was previously the Director of .NET Developer.

## Thursday 17:30

*Track 7 (Claverton Rooms)*

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**Getting HCI in business: a surgery**

*Peter Johnson, University of Bath (UK)*

## Friday 09:30

***Session 8: Looking Ahead***

*Track 1 (University Hall)*

Full Paper

**Could I have the menu please? An eye tracking study on conflicting design guidelines**

*John McCarthy, Jens Riegelsburger & Angela Sasse*

The paper examines the role of convention in web design guidelines. In a controlled study, recording eye movements, we show that users rapidly adapt to layouts that violate existing conventions.

Short Paper

**What is poor man's eye tracking good for?**

*usability testing, eye tracking, empirical methods, toolkits*

*Carsten Ullrich (Germany)*

We compare hardware eye-trackers with our software eye-tracker DFKeye, wrt. data that can be collected and similarity of data patterns. This suggests that DFKeye is an easy-to-use, inexpensive, reliable alternative.

Short Paper

**ProPose: a multimodal user interface for posing virtual humans**

*multimodal interface, mannequin, video processing, storyboarding*

*Dan Parnham (UK)*

We explain the design and realisation of ProPose, a software tool that interprets the pose of an artist's mannequin via video monitoring, and demonstrate its use in a practical storyboarding application.

Short Paper

**Video for the masses: measuring the educational effectiveness of very low bit-rate video streams**

*streaming video, effectiveness, education, pedagogy, elearning.*

*Sally Thornhill & Lee Griffiths (UK)*

A laboratory study conducted to explore whether subtly different low quality and low bit-rate streamed video contributes to the pedagogical effectiveness of video and whether there was a measurable difference.

Short Paper

**Throwing models for large displays**

*wall-sized display, dual-display, drag-and-drop, drag-and-throw, push-and-throw*

*Mountaz Hascoët (France)*

In this paper, we propose two new interaction models for dragging objects on wall-screen – a large structured display surface. Both models aim at providing good user control over throw precision and low error rates and are compared to regular drag-and-drop.

## Friday 09:30

***Session 9: Interaction Techniques***

*Track 2 (Room 8W 2.1)*

Full Paper

**Improving the acquisition of small targets**

*Andy Cockburn & Andrew Firth (NZ)*

Describes the design, implementation and comparative evaluation of three enhanced techniques for target acquisition: expanding targets, sticky targets, and goal-crossing targets. Evaluation shows sticky targets to be popular and effective.

Full Paper

**Comparing speed-dependent automatic zooming with traditional scroll, pan and zoom methods**

*Andy Cockburn & Joshua Savage (NZ)*

Describes a scrolling enhancement that reduces visual blur and disorientation on rapid movement by automatically zooming out as scrolling speed increases. An evaluation shows that it can improve user performance.

Short Paper

**Evaluating mobile text entry with the FASTAP™ keypad**

*Mobile text entry, evaluation, novice and expert use.*

*Andy Cockburn and Amal Siresena (NZ)*

Describes the evaluation of the Fastap™ keypad for text entry on mobile devices. Results show Fastap is both efficient and rapidly learnable when compared with industry standards for text messaging.

Short Paper

**How finite state machines can be used to build error free multimodal interaction systems**

*multimodal interaction, recognition-based technologies, mutual disambiguation, error robustness, finite state machines, interaction design.*

*Marie-Luce Bourguet (UK)*

In this paper, we discuss several techniques, based on the finite state machine formalism, for modelling multimodal interaction designs and testing their robustness to speech and gesture recognition errors

## Friday 09:30

***Session 10: Design Methods and Principles*** *Track 3 (Room 8W 1.1)*

Full Paper

**A method for organizational culture analysis as a basis for the implementation of user-centred design into organizations**

*Netta Iivari, Kaisu Juntunen & Ilkka Tuikkala (Finland)*

Presents results from experimentation with different data gathering techniques in the analysis of organizational cultures in the context of implementation of user-centered design. Different implementation strategies for different culture types suggested. Novel approach.

Full Paper

**The application of urban design principles to navigation of information spaces**

*David Benyon & Bettina Wilmes (UK)*

This paper looks considers people living inside information spaces. We demonstrate how some ideas taken from the design of built environments transfer to information spaces such as websites.

Short Paper

**Culture as "what people do"; the localization of culture and cross cultural design**

*Cultural typologies, ethnography, context, cross-cultural usability*

*Karen Gunter & Dave Randall (UK)*

Provides an overview of different typologies of culture and their relation to cross-cultural usability. Argues against the engineering approach that is prevalent in HCI design in favour of a more human-centred method, using ethnographic techniques.

Short Paper

**Iterative design of tangible user interfaces**

*tangible user interfaces, RFID, prototypes, children, iterative design, computer supported collaborative work*

*Jennifer Rode (UK)*

We discuss the lessons learned creating a tangible user interface (TUI) to teach children argument. By iteratively developing our TUI we isolated problems with physical affordances versus the technology components.

## Friday 09:30

***Panel Session 4***

*Track 4 (Room 5W 2.3)*

**Identifying the grand research challenges for HCI and how the community can best meet them**

*Peter Johnson, Tom Rodden, Guy Boy, Philippe Palanque (UK)*

This panel session provides an European and international perspective and leads discussion to identify the main research challenges. The focus is on the development of a longer- term view of HCI research. The discussion will encourage the identification of both basic/core and applied research and the development of multidisciplinary approaches.

## Friday 11:30

Keynote Friday *University Hall*

**Provisional subject: Tangible bits**

*Hiroshi Ishii (US)*

Hiroshi Ishii is a tenured Associate Professor of Media Arts and Sciences, at the MIT Media Lab. He co-directs Things That Think (TTT) consortium and directs Tangible Media Group. Hiroshi Ishii's research focuses upon the design of seamless interfaces between humans, digital information, and the physical environment.

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***Keynotes: what's in store?***

*Bob Regan*

Accessibility is the effort to ensure access to web content for people with disabilities. Far more complex than HTML, Flash raises unique possibilities and challenges for both designers and end users. This session looks at issues and techniques related to the development of accessible content using Flash MX.

*Gordon Smillie*

Gordon will be discussing the 'Tablet PC' and how a world-wide programme of usability and research has made it one of the most easy to use devices on the market

*Hiroshi Ishii*

Where the sea meets the land, life has blossomed into a myriad of unique forms in the turbulence of water, sand and wind. At another seashore between the land of atoms and the sea of bits, we are now facing the challenge of reconciling our dual citizenships in the physical and digital worlds. Windows to the digital world are confined to flat square screens and pixels, or 'painted bits'. Unfortunately, one cannot feel and confirm the virtual existence of this digital information through one's body. Tangible Bits, our vision of HCI, seeks to realize seamless interfaces between humans, digital information and the physical environment by giving physical form to digital information, making bits directly manipulable and perceptible. The goal is to blur the boundary between our bodies and cyberspace and to turn the architectural space and objects into an interface. In this talk, Hiroshi Ishii presents a variety of tangible user interfaces that the Tangible Media Group at MIT Media Lab has designed and developed in recent years.

# "Thou hast spoken for us, madonna, as if thy eldest son should be a fool..."

**Cassandra Hall**

What a good job that God had a sensible set of design guidelines and knew how to use his ISOs when he went about making people or HCI would be in serious trouble just now. It struck me as I looked at the latest bumph from HCI 2003 that conference after conference claims that it is pursuing the idea of designing for people. But actually, the reality is that if people weren't so darned clever and resilient computer systems would be in deep doo doo. And the closest that Bill Gates would come to marketing Windows, would be as a double glazing salesman.

Now, I want to instigate what I'd call a discussion. So let's set the ground rules. By discussion I mean a bottle of wine round the kitchen table, not raised voices and slammed doors. So, grab your Chianti and let's begin.

The truth is we are failing people. We are excluding them rather than encompassing them. We are limiting them rather than widening and deepening their user experiences. We are concentrating on the mote in the future and neglecting the beam of the present. The web, that lovely brainchild, has turned into a morass of pornographic sites and daft adverts, and rather than bringing the freedom of self expression sans frontiers it's more like a UK motorway with roadworks signs, diversions and dead ends. And I wonder exactly what we are doing about it.

As the great and the good gather for an intellectual soak in Bath, I find myself wondering if I should have stuck to physics and helped find the Grand Unified Theories – GUTs – instead of flogging the guts out of what is starting to feel like a dead horse. Ordinary people seem no closer to using computer systems to enlarge and deepen their experiences than they did a decade ago and many of my colleagues seem to have gone round in circles that are so ever decreasing that there is now little sign of them nor of their research.

OK people, you have world enough and time just now to think HCI and discuss the future of our field with brave and death-defying honesty. I think it is now we should be asking ourselves just what it is that we are really hoping to achieve? I blame myself as much as I blame anyone else out there because my own research in matters HCI is so esoteric that it borders on mysticism. And to be honest the Invisible University isn't the sort of place to either encourage or to really understand what is useful to ordinary people. The 'people' (I use the term loosely) around the campus here are so rarefied that I doubt they'd recognise an Ordinary Person (let alone a typical user) even with the Observer's Guide in their dainty hands and a telescope. In fact, observing them I begin to subscribe to the idea of alien infiltration, so off-the-planet are some of them.

As I explain to my students each new session, the first requirement of HCI is interaction and you can't do HCI effectively if you can't interact with people and computers yourself.

But I hate to say this. I'm beginning to wonder if actually we, as an HCI community, have the powers to do that at all? Who are we communicating with for goodness' sake and how much of what we say does anyone listen to? Or do we listen to them with anything like the politeness, stamina and tolerance we ought to be able to muster? I know that people are genuinely concerned about whether HCI is properly and aptly named. And I understand the argument that wrong labelling is counter productive. But I have to conclude that I really wish we'd stop arguing about what we're going to call ourselves and get on and actually do something! It's all so much evasive action. Solve some real problems that real people have and stop pussy-footing about with stuff that is so out of this world that it won't be any use to most people sitting at conference today unless they've found a cure to old age that is anything more substantial than skin-deep.

OK this isn't going to endear me. But Landauer is oh so right. We need solutions to small problems not wonderful GUTs however much more fascinating they might be. And however much more interesting searching for the Grail might seem.

Let me give an example. You watch a novice user use the web and you'll be amazed at how they use search engines like Google to navigate to sites. I don't mean find sites as in: "I wonder if such a site exists?" I mean they want to go to the Tesco site, they've been there a billion times before. They go to Google, they type Tesco into the search engine and scroll down till they think they've located the proper URL. Trust me. I've watched it. I haven't made the mistake of asking and being given the answer I'd like to hear.

If you look at how elderly people in particular work then you'll know that learning new stuff takes time so they prefer a fix that guarantees success even though it's lengthy. They are (particularly the men) quite often poor typists. Fingers might be stiff and slower through arthritis and rheumatism, and processing can be slower, more laboured and error prone. It's harder concentrating and keeping track of the task. It's harder to stay focused and it's easy for distractions to cause the original task to be forgotten.

Working memory is less agile. So the search engine fix is preferable to them. They prefer to identify the correct URL rather than try to type it in correctly themselves. Why don't they add it to favourites? Because users don't always think in terms of reuse necessarily. And scrolling through many locations for the correct item is time-consuming and confusing. Novices don't always understand how to organise their desktop and they have to remember where the item has been stored in any case. The fonts are small and difficult to read and novices can't always reset them and may not know that it's possible. Many won't realise that typing the start of the URL will bring up the rest if it's a site that has been visited previously.

In addition, many elderly people are only too painfully aware that working memory isn't as reliable as it was, that you can no longer depend on it, and that recall is more time-consuming than it used to be. Even if they recall something, they are so accustomed to recalling incorrectly that they don't always have faith in the memory they have recalled.

Don't stop reading. Don't dismiss this as not relevant to you now. Because here's the trick. It is. You may be twenty-five today (oh wish) but, to remind you of Floyd, ten years will fly and so will the ten after, and the ten after that. Unless

death gets you young, old age will come to you as surely as Tony Blair's hair is falling out along with his popularity.

OK, I'm being obvious but I wish HCI would go for the obvious rather more than it does. Sometimes the obvious gets overlooked and we struggle with things that are small and seemingly insignificant but fixing them would make a huge difference to our lives. Sure, it's nice to redecorate the whole house and install new furniture but actually fixing a dodgy flush on the toilet might make living in the house a hundred times more pleasant and tolerable.

When I see novices and, particularly, elderly people use the web I could scream with frustration and anger. There's new ideas coming out all the time. How we will interact with quantum computers, how we can control a system using thought waves or vision. Yet no one has solved the relatively small and easy problem of how to help people navigate to the website they want to visit!

One of my many rejected papers cited Landauer and I believe a totally out-of-touch reviewer objected to my using 'old research'. (Yes, moi aussi, I know rejection). Old research my hat! Hear me, Thomas Landauer, if anyone has any respect from me at all it's you. You say it for the little guys and gals. You say it for small irritating problems that really matter. Yes a GUT for HCI would be nice. One day it'll be there I'm sure but those of you who right now are not doing an Indiana Jones and looking for fame and glory but are finding a solution that means Jo and Joanna Bloggs can find Tesco faster and with less hassle than they did before, you have my gratitude, admiration and last euro even if all of your papers end up along with mine in that great big recycle bin in the sky.

So, this is a plea. Sure let's have conferences with GUTs and bells and whistles and those tassel things they give to the cheer leaders. But can we please also have some of those ordinary things like door-stops, which aren't profound and aren't going to set the community on fire but will make the lives of ordinary, ordinary, ordinary folk a few seconds faster for each activity and a lot less daunting and frustrating than they are just now.

Let's have solutions for small problems that will help the here and now along with those exciting innovative ideas that take us closer to Star Trek's computer. OK none of that is glorious but it's practical. And as I write it I'm reminded of a girl friend who, getting married straight after university, told me that the wedding was lovely and the presents were nice but she wished someone had given them a plastic washing up bowl and a pedal bin to use right now rather than the gorgeous china vases they'd been given for a house they might one day own.

Let me end the column by pointing back to HCI 2002 and reminding you that HCI 2004 is already steaming into hailing distance. But first we have HCI 2003 to look forward to and so I'd like to end with an analogy a bit closer to home. The Wife of Bath reminds us, not everyone can be pure white bread; some of us have to be common barley bread. But remember, Jesus was able to feed the five thousand with his common barley bread.

I know what I would rather do.

## Post Script

Thank you Paul Curzon for your nice essay (*Interfaces* 55). I enjoyed it a lot though I don't like dogs – my attitude is roughly equivalent to Gollum's attitude to hobbits. I also forgive you the baseball though I deplore sarcasm. Actually Paul, I have a horror of becoming a Loved One. But I read Waugh's novel when I was 16 and did a stint recording tombstones in a churchyard. It's hard to believe in affection when you can't read the 'Gone But Not Forgotten' for the weeds.

Now is as good a time as any to say that some people have expressed a desire to communicate privately with me. Sorry folks, if I get any more email I'll need another secretary. You have to restrict your admiration to dedicating essays like Paul has done. So, if there's something you want to say to me, write it for *Interfaces*. It'll be much more rewarding than talking to me. As anyone at the Invisible University will explain, I'm much better scene than herd. And it'll make dear Laura the happiest editor alive. She'll tell you that discussion is the stuff of magazines.

## Yet another Post Script

I actually missed my deadline for this edition of *Interfaces* because of the most irritating conflict with XP. It eventually necessitated reinstallation of the OS. Before any of you think that I'm overreacting in my column here and that systems are approaching anything like OK then reinstall XP. Read all the instructions on screen and do it. But not before you back up EVERYTHING and ensure you have installation disks for EVERYTHING – i.e. think about how you intend to reinstall software bought from and downloaded from the Web! It seems a great way to do things at the time but when XP denies all knowledge of applications you can see sitting there on your screen, it isn't quite so novel!

I like XP but only when it runs correctly. When things go wrong you need AT LEAST my level of hardware/software incompetence to get anywhere near being able to put things right. This is NOT OK! It's like expecting passengers on an aircraft to understand aerodynamics before they can fly on holiday to San Diego. Furthermore, wherever MS get their picture of the average XP user it isn't from planet Earth. Try the activation over the phone and see. You have to key in via the phone 25ish digits copied from the screen and then listen to 25ish digits read back which you key in directly to the screen (or write them down I guess). Anyone who reinstalls XP needs to be one or all of: a) desperate b) stupid c) God. I'll leave you to decide which one I was/am.

And finally, enjoy your Bath! May it be warm, sudsy and inviting and may you leave refreshed and keen to make a clean start. I'll be there sans doute. Make sure you are.

***Cassandra Hall***
*The Invisible University*

**CASA2004**
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University of Geneva, Switzerland
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The Computer Graphics Society is pleased to announce the Computer Animation and Social Agents 2004 Conference. MIRALab will organize this 17th annual conference on Computer Animation and Social Agents with the support of IFIP WG5.10 (Computer Graphics and Virtual Worlds).

Paper submission deadline: **October 20, 2003**
**casa2004.miralab.unige.ch**

# CHI 2003 Workshop Report

## CUE-4: Lessons in best practice for usability testing and expert evaluation

**Chris Rourke**

Usability tests and expert reviews are staple methods of the field of human–computer interaction, but how effective are they? This has been the question behind the series of Competitive Usability Evaluation (CUE) studies, and Chris Rourke reports on the most recent one.

Earlier this year I was selected to be one of the participants in CUE-4, the most recent comparative study into the effectiveness of common usability assessment methods, and the process and results have been very intriguing. The goal of the CUE studies, conceived and led by Rolf Molich of Dialog Design, is to understand the strengths and weaknesses of popular methods, such as expert review and usability testing, and to see how consistent usability professionals are at finding potential problems using these methods.

### What is CUE?

In an ideal world different usability professionals reviewing a given site would find the same problems and follow a similar methodology. In case you have not noticed, the world is not perfect, and there can be a great deal of variation across the problems found and methods used by usability experts. This is why the information gathered from the CUE studies has been some of the most interesting, and controversial, research about our profession as a whole. A quick summary of the results of the earlier CUE studies shows why some of the results have caused waves:

CUE-1 was a comparative usability test of a Windows calendar application, in March 1998, by four teams working independently. Collectively the four teams found many usability problems, but in comparing the work of the teams it was apparent that there was very little overlap between the findings of the individual teams. This set the stage for a more extensive follow up study.

CUE-2 was a usability test of www.hotmail.com carried out in late 1998 by nine professional international teams. Each team was given the same interface, test scenario, and objectives of the site but they were allowed to follow their own practices for testing method and reporting. Again the study revealed many usability problems and showed that many usability professionals make serious errors when conducting and reporting a usability test.

Although it showed that collectively they found a combined total of more than 300 problems (good news for the profession – we can find many problems even in high profile, state of the art sites like Hotmail) there seemed very little overlap in the conclusions. In fact, there wasn't a single problem that every team reported. Eight of the nine teams missed 75% of the usability problems, and only one team reported more than 25% of the collective total. Some of the main factors contributing to this were the variation in tasks developed for the test and the level of detail in the reports. This report clearly showed that the assumption that all usability professionals, using the same methods, would get the same results was wrong.

Moving away from the usability testing method, CUE-3 was a comparative test of expert evaluations conducted by 12 Danish usability professionals. This was a pilot test, no conclusive results were drawn, and it was eventually abandoned.

### CUE-4: Usability testing and expert evaluations

The most recent comparative study, CUE-4, took place as part of a workshop at the CHI conference this year in Florida. It aimed to show best practice within expert reviews and usability testing, and to compare the results of these two methods. By analysing the differences in the expert findings in detail, it was intended to propose changes or important caveats to the methods used and to set a benchmark against which other usability professionals can measure their skills.

Seventeen evaluators were selected following a call for participation in CUE-4. Fourteen were from the US and three from Europe, including myself as the only UK participant. Of these evaluators, nine were asked to conduct a usability test, and eight to conduct expert evaluations. Everyone evaluated a US hotel web site and especially the reservation system developed by iHotelier (*www.ihotelier.com*).

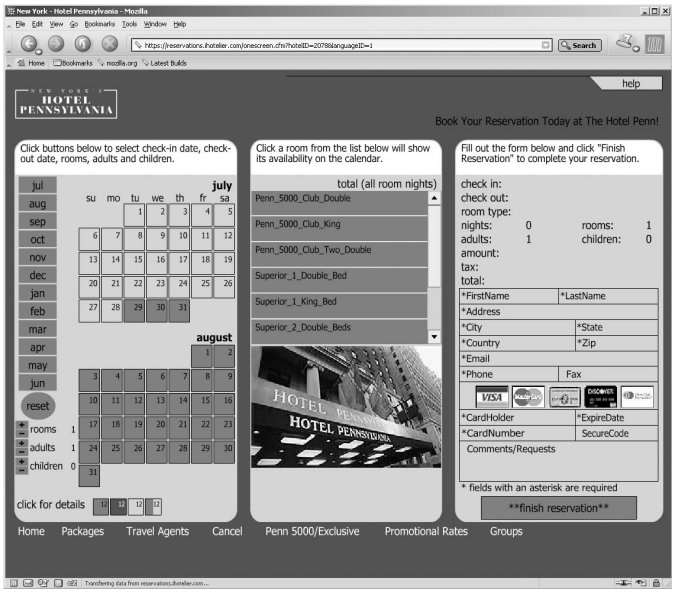
The hotel's reservation system comprised a single Flash page that showed room types available, a calendar for selecting dates, and form fields for address and payment details. These sections are interactive so that one can see which rooms are available for selected dates or, conversely, which dates are available for a selected room. This system was developed to overcome some drawbacks to linear HTML systems, such as selecting dates for staying at the hotel, only to find the room unavailable.

Each team was told about the target audience (adult travellers with web access) and some key areas to be explored such as finding the cost to rent a room for a specific period, making and cancelling a reservation, and making specific requests such as no-smoking rooms. Beyond that, each team was allowed to conduct the usability test or expert evaluation using their usual methodology. Usability test teams chose their own tasks and the number of subjects, although a common reporting format and severity rating scale was used for consistency and ease of comparing the results.

### Comparing the results across evaluators

At the CHI 2003 Conference, all of the evaluators met and discussed the findings. We soon built some consensus as to the range of problems identified and fortunately these were quite useful for the end client from iHotelier who was unaware of about two thirds of the problems reported. Whatever the results of the study, they should be happy with their software being scrutinised by some of the world's leading usability professionals. Some of the main results were:

- Approximately 800 problems were identified in total by the groups, but when they were de-duplicated there were approximately 300 different problems. Although there was a strong level of agreement in the range of problems found, there was far less agreement in prioritisation in terms of the top 5 positive and negative findings.
- In comparing the results of expert evaluations with the empirical results of the testing, there were almost no 'false alarms' of problems predicted by the expert evaluation that did not




The Flash-based Hotel Penn Reservation system

actually occur in any of the usability tests. This bodes well for the expert evaluation method as a discount predictor of actual problems, so long as the evaluators have sufficient expertise.

- However, there was wide variation in the methodology used, the time invested (between 6 and 68 hours for expert reviews, 18 and 200 hours for usability tests) and number of test subjects used (5 to 15). Because we were able to report a maximum of 50 problems, it was not really possible to judge whether the extra time spent was useful in discovering more problems, or where the ideal 'point of diminishing returns' was reached for either the testing or evaluation.
- The number of problems found varied from 20 to 50 but this was largely due to differences in the level of granularity of usability issues reported. Very often one team reported a single problem which contained 2 or 3 'micro' problems reported individually by others.
- The other interesting finding was that despite the fact that we had all been given the same scale for rating problems in terms of their severity, there was considerable variation in which ones were critical, serious, and minor, and indeed which ones deserved to be part of the 'top 5 problems' list we were asked to generate.

## Questions about usability best practice

The session also raised several practical issues for the wider usability community regarding methodology and best practice, such as:

- What is the most cost-effective, yet valid and accurate, way to recruit subjects? One person conducted the tests in a local Starbuck's coffee shop that had a wireless connection, and informally recruited customers for short 20 or 30 minute tests. Others put a great deal of effort into the recruiting, ensuring that it was balanced for gender, age ranges, travelling experience etc.
- What is the form of severity/priority ratings that is most useful to the end client? Clearly, even with common definitions of the severities, subjectivity of the test facilitator inevitably creeps in, especially for the expert evaluations. An informal poll of the severity scales normally used by the participants indicated a great diversity on this aspect. Some use no priority rating scale at all (because they report only important problems) whereas others break the problem down into two or three dimensions such as the likelihood of encountering the problem, potential impact, etc.

Although it would be ideal if the usability field aimed for a common priority rating scheme, there are different requirements between in-house usability teams integrating with a complex bug-tracking system, and a consultancy where the client normally appreciates (and has time to read) a much simpler system.

- To what degree should we let subjects explore 'off task' during usability testing? Another point of difference between the teams was whether the user was allowed to explore the site on their own, following their own curiosity and loosely defined tasks, or whether they should follow tasks that have a clear goal and ideal path for finding it. Most agreed that giving the user the opportunity to explore on their own helps to unearth some interesting problems, and some degree of free browsing should be included. However the nature of the test, whether it is exploratory and diagnostic, or benchmarking against previous tests, also needs to be considered.
- How much are the original 10 usability heuristic definitions referred to during expert reviews? Some expert evaluation teams referred back to the original heuristic evaluation proposal by Nielsen and Molich, and gave their finding the official 'heuristic' title such as 'Flexibility and efficiency of use', then explained the specific instance in more depth. Most others considered the actual heuristics much more loosely and did not use them as categories for reporting their results, especially as they can be somewhat alienating to readers of the reports who are not already familiar with the 10 official heuristics.
- What best characterises a quality usability report and usability testing methodology? Is it the number of solutions recommended or the percentage that can be actually acted upon? Should users be encouraged to give their own details, even their own credit card numbers (as long as they are not charged) in parts of the test site where registration or purchasing is required? This led to extensive discussion which tended to merge into a 'tips and tricks for usability testing'.

## Lessons for the future

The intention is that the results of the CUE-4 will be published in full, including all seventeen test reports and supporting analyses which will be published by the session organisers Rolf Molich and Robin Jeffries of Sun Microsystems. The location has not yet been determined but a likely place will be Rolf Molich's own web site www.dialogdesign.dk.

Statistics are still being worked out on the raw results, and these will eventually be published to show the actual degree

of consensus in the findings of the usability testing and expert evaluations. We also plan to use the session as a learning source for the field, and there are plans to 'freeze' the hotel reservation system as it was during the evaluation so that other professionals or HCI students can perform their own evaluation and compare their results to those of the participants in CUE-4. Considering that the study has again highlighted the variability in the methods applied and the results reported, this should be of great use to the profession as a whole.

***Chris Rourke***
*User Vision*
*chris@uservision.co.uk*

With thanks to all of the participants in CUE-4: Avram Baskin & Chauncey Wilson (Bentley College, USA), Carol Barnum (Southern Polytechnic State University, USA), Carolyn Snyder (Snyder Consulting, USA), Chip Alexander (Sun Microsystems, USA), Chris Rourke (User Vision Ltd., UK), Don Williams (Microsoft, USA), Eric Pressman (Macromedia, USA), Hannu Koskela (Datex Ohmeda, Finland), Joe Dumas (Oracle Corp., USA), Joshua Seiden (36 Partners, USA), Ron Perkins (DesignPerspectives, USA), Sharon Laskowski (NIST, USA), Steve Krug (Advanced Common Sense, USA), Susan Campbell (ZAAZ, USA), Tim Marsh (Eindhoven University of Technology, The Netherlands), Tom Tullis (Fidelity Investments, USA)

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# Design for Life: HCI2004

## 18th annual conference of the British Computer Society HCI Group
## Leeds, UK, 6–10 September 2004

Join researchers, practitioners and educators from around the world at HCI2004 where we will be exploring the theme of Design for Life. As designers, evaluators and implementers of interactive systems we have great responsibility. The systems we design impact upon the lives of the people who use them – for good or ill.

Design for Life has many facets, some of which are traditional ones for HCI while others are new challenges that we must face:

**Design for** *the richness of life*
Recognising that successful interaction is as much about experience, emotion, satisfaction and creativity as it is about task, productivity and effect.

**Design for** *all stages of life*
From childhood to older adulthood.

**Design for** *the diversity of life*
For users with diverse needs, from diverse cultures and with different perspectives and priorities.

**Design for** *long life*
Not focusing on passing phases and fads but on products that adapt to changing needs and on approaches that can contribute to sustainable developments.

**Design for** *quality of life*
Designing systems that are liberating, humane and enabling, and which recognise the user's individuality, rather than constraining, mechanizing and dehumanising existence.

**Design for** *real life*
Ensuring what we do makes a difference in every day experience and is relevant to the person on the street.

**Design for** *all aspects of life*
For work, for leisure, for travel, for fun.

**Design for** *community life*
Supporting society, government, learning and health.

HCI2004 will be hosted by Leeds Metropolitan University at their attractive Beckett Park Campus. Leeds is a city well suited to host a conference on this theme. Historically an industrial town of textiles and engineering, it has successfully adapted itself to a changing world, investing in finance, leisure, culture and digital media. It balances its historical heritage with life as a vibrant modern city: refurbished arcades, theatres, squares, and waterfronts provide visitors and residents with a rich variety of eating, shopping and cultural experiences.

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For more information please contact Janet Finlay (j.finlay@lmu.ac.uk) or visit our website at

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# CHI 2003 Workshop Report

## Perspectives on HCI Patterns: Concepts and tools (introducing PLML)

**Sally Fincher**

At CHI 2003, 15 participants gathered at a workshop to discuss perspectives on HCI patterns. We met to discuss what was important in this area, both in terms of conceptual understanding, and for pattern-related tools. We spent two days in hearty debate. Now, what would normally follow here is a narrative account of the interesting people who were there, and their interesting positions: a potted version of the discussions that you missed. However, this workshop produced something more robust than discussion alone, so we break the 'workshop report' genre to introduce you to PLML (pronounced *pell-mell*).

A significant outcome of the CHI2003 workshop is the Pattern Language Markup Language (PLML) specification. Our goal in deriving PLML was to bring order to the many (inconsistent) forms pattern authors have used. We were seeking a way in which patterns and pattern languages from various authors could refer to patterns in other collections and could identify common elements across collections: ways in which patterns from disparate authors could be combined into specific, thematic collections, perhaps even combined into larger meta-collections.

The discussions of what might be included in such a specification were driven by dual concerns of what we considered to be important in the domain, and the variety of forms that had already been instantiated by various pattern authors (Fincher, 2000).

Here are the elements we believed to be important (and why):

**<pattern id>**

It is obvious that every pattern needs to have a unique id, within its own collection.

**<name>**

The naming of patterns (like cats) is a difficult matter (Eliot, 1962). All pattern authors are convinced of the importance of names, and pattern users like to use them as shorthand. There is less agreement on the precise form or content of these. However, all agree that they should be short.

**<alias>**

*"... The name really is 'The Aged, Aged Man.'"*

*"Then I ought to have said 'That's what the song is called'?" Alice corrected herself.*

*"No you oughtn't: that's another thing. The song is called 'Ways and Means' but that's only what it's called, you know!"*

(Carroll, 1867)

Sometimes patterns, although named one thing, are called another. We indicate that with the <alias> element.

**<illustration>**

Most pattern forms contain a picture, a really good example of an instantiation of the pattern 'in real life'. For HCI patterns this usually means a screenshot, although it could be a contextualising image (perhaps a photograph of people doing something); multimedia clips are not unknown.

**<problem>**

The most common pattern-forms are structured around problem–solution pairs. So the 'problem' section describes the design situation that the pattern will address. It has been observed that characterising and formulating the *problem statement* is not the easiest part of developing a pattern (Borchers, 2001; Deen, 2000):

LAST THINGS FIRST
*Solutions to problems*
*are easy to find:*
*the problem's a great*
*contribution.*
*What's truly an art*
*is to wring from your mind*
*a problem to fit*
*a solution.* (Hein, 2002)

**<context>**

This can also be thought of as 'applicability'. This element was fought for particularly hard, and should be used to characterise situations in which this pattern can be most usefully ('naturally') applied.

**<forces>**

Many pattern authors like to include a description of the 'forces' in the environment that use of the pattern will resolve. The origin of this is a phrase in Christopher Alexander's seminal text *The Timeless Way of Building* (Alexander, 1979):

> "every pattern we define must be formulated in the form of a rule which establishes a relationship between a context, a system of forces which arises in that context, and a configuration, which allows these forces to resolve themselves in that context."

That's not quite how they've come to be used, and they are more common in software design patterns than within HCI patterns. When described, though, they need a home. This is their element.

**<solution>**

This should address the problem, and should generalise from the examples that the pattern contains. Usually, the solution is expressed in the form of an instruction.

**<synopsis>**

This acts as a summary of the pattern, and may be particularly useful for situations where there is limited display-space.

**<diagram>**

A diagram is different from an illustration. The purpose of a diagram is to communicate to the user of the pattern (the designer) details that are more readily expressed (and understandable) in schematic form. Sometimes this is a free-hand sketch; sometimes it is a more formal representation, such as UML.

**<evidence>**

This is a bit of a tricky one. Many pattern-forms have a 'body' section that contains more detail about, and discussion of, the design issue at hand. Some pattern authors do not have a separate section for the evidence that they have drawn on to harvest their patterns. Some collections enforce the so-called 'rule of three' whereby a pattern cannot be identified, cannot

A 'pattern' is a form of design representation formulated by Christopher Alexander in *A Pattern Language* (Alexander, Ishikawa, & Silverstein, 1977; http://www.patternlanguage.com) for use in architecture.

*A Pattern Language* espouses a design approach that focuses on the interactions between the physical form of buildings and the way in which that form inhibits or facilitates personal and social behaviours. Each 'pattern' follows a prescribed form that is based on evidence for, and examples of, the use of the pattern, together with instructions for how to achieve its effect. Various domains have subsequently adopted and adapted the notion, notably 'design patterns' in software (Gamma, Helm, Johnson, & Vlissides, 1994).

Since 1997 (Bayle et al., 1998) the HCI community has been working to develop UI and HCI patterns and pattern languages. We derived PLML as a specification for pattern languages in HCI but there is no essential reason why PLML should not be appropriate to pattern endeavours in other domains.

claim to be a pattern, if there are not three independent examples of its instantiation in the world. Anyway, there is enough divergence to allow two sub-elements of <evidence>:

**<example>** which includes known uses

**<rationale>** which includes discussion, and any principled reasons for the solution. That is principles of cognitive or behavioural psychology, etc, such as 'recognition is easier than recall'.

**<confidence>**

Does the pattern author believe that the pattern truly reflects an invariant solution? Or is it just a current 'best-guess'? If used, we propose that this should be expressed as a rating, normally a star-rating (following the system used in *A Pattern Language* (Alexander et al., 1977): zero, one or two stars).

**<literature>**

Often, a pattern will have references to other works; if those works are papers, references should be included here.

**<implementation>**

Sometimes a pattern will come with code, code fragments, or other details of technical implementation.

**<related-patterns>**

Patterns should never stand alone. This precept is more honoured in the breach than in the observance [ref Hamlet]. However, within a collection, this element shows the relations that express the structure of the whole. Between collections, it can serve to create thematic- or meta-collections. To detail related patterns, you have to link to them. The form of the linkage is:

<pattern-link type="" patternID=""
collectionID="" label="">

We propose that there are several pre-defined link types (to reflect the common ways collections are currently structured):

**is-a**
Means that this pattern is the same as, or is an alternative solution to, the same problem

**is-contained-by**
Means that this pattern is 'smaller' and is used (with others) to instantiate a larger one

**contains**
Means the reciprocal of is-contained-by

Finally, PLML contains a series of elements that indicate authorship and change management; they are: **<author>**, **<credits>**, **<creation-date>**, **<last-modified>**, and **<revision-number>**.

Here is the DTD that accompanies these descriptors:

```
PLML v1.1
<!ELEMENT pattern (name?, alias*, illustration?,
problem?, context?, forces?, solution?, synop-
sis?, diagram?, evidence?, confidence?, litera-
ture?, implementation?, related-patterns?,
pattern-link*, management?)>
<!ATTLIST pattern patternID CDATA #REQUIRED
>
<!ELEMENT name (#PCDATA)>
<!ELEMENT alias (#PCDATA)>
<!ELEMENT illustration ANY>
<!ELEMENT problem (#PCDATA)>
<!ELEMENT context ANY>
<!ELEMENT forces ANY>
<!ELEMENT solution ANY>
<!ELEMENT synopsis (#PCDATA)>
<!ELEMENT diagram ANY>
<!ELEMENT evidence (example*, rationale?)>
<!ELEMENT example ANY>
<!ELEMENT rationale ANY>
<!ELEMENT confidence (#PCDATA)>
<!ELEMENT literature ANY>
<!ELEMENT implementation ANY>
<!ELEMENT related-patterns ANY>
<!ELEMENT pattern-link EMPTY>
<!ATTLIST pattern-link
    type CDATA #REQUIRED
    patternID CDATA #REQUIRED
    collection CDATA #REQUIRED
    label CDATA #REQUIRED
>
<!ELEMENT management (author?, credits?, crea-
tion-date?, last-modified?, revision-number?)>
<!ELEMENT author (#PCDATA)>
<!ELEMENT credits (#PCDATA)>
<!ELEMENT creation-date (#PCDATA)>
<!ELEMENT last-modified (#PCDATA)>
<!ELEMENT revision-number (#PCDATA)>
```

Finally, the workshop was not over when the fat lady sang. Not only have on-line discussions continued, but Martijn van Welie has already made his entire collection PLML compliant. See: *http://www.welie.com/patterns/index.html*

Susan Babutzka has put PLML-compliant versions of some of Jan Borchers' patterns from his book (Borchers, 2001) online. See: *http://hci.ethz.ch/patterns/borchers/patternIndex.html*

## Workshop Leaders:

Sally Fincher, Janet Finlay, Sharon Greene, Pedro Molina, John Thomas

## Workshop Participants:

Sherman Alpert, Jan Borchers, Ashraf Gaffar, Scott Henninger, Javier Hernández, James Lin, Daniel Sinnig, Martijn van Welie, Till Schümmer, Jenifer Tidwell,

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**Workshop Website** (including this report)
*http://nitro.watson.ibm.com/chi2003Workshop/*


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# Book Reviews

## Edited by Sandra Cairncross

Somehow I have found myself 'persuaded' to take over as Book Reviews Editor, although to be honest, enjoying books as much as I do, I did not need much persuading. Very soon, parcels of books started to arrive at my office and that's when I realised that the hardest part of this job is not persuading other people to do reviews but letting any of the books out of my hands! They all looked so interesting. However I have managed to let some go and would welcome offers from others. We are planning to put a list of available books on the *Interfaces* website, where you can volunteer to review them, but, equally, if you come across a book that you think other readers of *Interfaces* would find interesting then please get in touch.

We are planning a new feature – reviews of classic text books by the students themselves; let's see what the users think. So if you are a student, or if any of your students would like to have their say, then please contact me.

Thanks to those who have already volunteered to review books for this issue (and especially meeting the deadlines, which made my life easier) and special thanks to Xristine for all her hard work over years. Xristine has promised to do the odd review (and I quote from her last editorial) so you haven't heard the last from her.


***Sandra Cairncross***
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*Paper Prototyping: The Fast and Easy Way to Design and Define User Interfaces*
Carolyn Snyder
Morgan Kaufmann, 2003
£21.88

ISBN: 1-55860-870-2


There are many impediments to the task of designing user interfaces, all well rehearsed in the literature. For designers and for user interface design students the need to produce artifacts that can be subjected to fast, frequent, iterative testing and re-design is complicated greatly by the problem of needing to produce these artifacts in the first place.

Many over the years have produced tools that claim to allow testable prototypes to be developed quickly, but one does not need to use many of them for very long to realise that the easy can be done almost immediately, but the very slightly complex often cannot be done at all.

Rather than live in dread of the day when they have to understand and modify machine-generated user interface code to build the design intended, the intrepid can instead give up a year or so of their life, two feet or so of bookshelf space, and can learn the API of a serious user interface toolkit accessed via whatever language the builder of the host operating system decided to objectify.

As well as being a task that can be performed very few times during a career, this excludes potential designers who are not programmers. It can prevent them all from learning what is actually important about design, locking them into a particular set of constraints and interface guidelines, and is to ignore often stated arguments in software engineering about the relative costs of correcting design flaws at different stages of the design lifecycle.

This is the context in which Snyder makes the case for designers to instead use paper-based methods to design user interface prototypes. Rather than coding, with a pile of raw materials one would use for a Blue Peter construction project, develop realistic, testable prototypes in a few days, possibly hours.

Empty application windows can be drawn on large sheets of paper, menus can be drawn on index cards, and pieces of cardboard and sticky-backed plastic can represent other user interface elements, being removed, replaced and redrawn in response to usability study participants pointing to pieces of stationery as they perform realistic tasks. Like the argument used to promote paper-based prototyping methods, the use of these methods is probably also familiar.

So what does Snyder manage to contribute to their use and the possibility of their wider use in future? The blurb on this volume makes claims such as that it contains 'all the practical information you need to make paper prototypes and get cost-effective usability data about your user interface designs'; that it 'is the definitive source' for understanding the technique; and that it forms a 'manual to answer the many questions that everyone will have when they get started'.

Justified praise from knowledgeable

PhDs? Or would one be better advised to heed the warning of Professor Griff when he said 'Don't believe the hype!'

What Snyder does manage to achieve is to clearly contrast paper-based methods with similar methods, such as Wizard of Oz, in a very precise and readable way. What she also achieves is to describe paper-based prototyping in a way that the reader is confident that they could attempt it and gain valuable results, and understand how to judge their progress and development of expertise in prose that is elevated far above simple check-list HCI.

While we seem to be many years on from 'Cost-Justifying Usability', the same arguments, or variations on them, still need making to management and clients. Snyder closes the book by attempting to head off some of the objections that might be used against paper-based methods. In an interesting twist the argument against user-centred design here is the low cost – how seriously can 'arts and crafts' projects be taken? How can one charge such a seemingly large sum for them?

Snyder argues well, but not stridently, for the places of design and expertise in user interface design. I remember a conversation with one of my masters students who wished, as his dissertation project, to boil all of UI design down to a checklist for programmers to follow. This, he believed, was all there was to producing usable systems. I hope that after reading Snyder he would not believe his project possible – I also hope our teaching did not help form his opinion.

Snyder stresses, as many others have before, the need for trained UI design teams, and for designers to take seriously ongoing development of their expertise, and for their expertise to be respected by the organisation, even if the methods used look like playtime in kindergarten.

Where the book does not live up to the claims made for it is in the suggestion that all one's questions are answered. Snyder says all there is currently to say about paper-based prototyping (there is a full bibliography, welcome and surprising in a book aimed mainly at practitioners), and says it well (there is no material that feels repetitious and the book is far from a struggle to finish).

There are noticeable gaps though. On the issue of conceptual modelling, determining what should appear on-screen, and why, in order to support tasks and create a consistent mental and navigational model, too often HCI has offered us a form of a famous cartoon by Gary Larson.

This depicts two mathematicians standing at a blackboard, on the left hand side of the board is a dense collection of incomprehensible equations and deductions, on the right is the solution, a theorem excitedly underlined and followed by a joyously written Q.E.D. In the centre of the board, the bridge between the premises and conclusion, appear the words 'and then some magic happens'.

Snyder only hints that between requirements and paper prototypes, magic is needed. Bruce Tognazzini's call (in 'Tog on Software Design') for designers to explain their magic tricks to the rest of us is not responded to here. If all our questions were truly answered, it would be.

If we accept that we are in the interaction design business now, the book is also very light on this subject. Snyder calls the members of the interaction team who move and replace elements of the prototype in response to test subjects' actions 'Computers' (with a big C). This is a book that contains very little Computer (big C) science. How they are meant to respond to user behaviour, how action sequences are structured, is not addressed, being reduced to barely documented (at best) context-free stimulus–response pairs.

Task analysis and other aspects of modelling interaction are left as undescribed noises off. With apologies to Voltaire, to conclude, in this book we find nothing that is new, but much that is pleasurable, and much unsaid that needs saying.

This book is comprehensive on the method it describes, and will be valuable to students and existing practitioners for some time to come, but the method covered is only part of design, and the book needs integrating into a programme of far wider study and reading. How widely, and where else, we need to look we are unfortunately not told.

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*Working with Groupware: Understanding and Evaluating Collaboration Technology*
J.H. Erik Andriessen
Springer, 2003
£35.00 (£26.25 BCS Members from BCS web site)
ISBN: 1-852-330603

It is very surprising to find a new book on groupware particularly as the term fell out of general usage in the mid-1990s. It is even more surprising to find a book on groupware as part of a series on CSCW.

Andriessen approaches groupware from the work and social/organisational psychology perspective for which he is known. He presents the book in two parts. The first, covering the first three chapters, discusses technologies to support cooperative working. The second part of the book, covering chapters four to eight, has a more theoretical and softer feel, ranging over issues as diverse as situated action, organisational acceptance, and interpersonal communication, through to brief discussions of trust and identity.

The book as a whole is well written and coherently structured, and is illustrated with numerous diagrams of the boxes-and-elegantly-curved-arrows variety.

Turning to specifics, the treatment of technology is dominated by references to older communications technology with only a nod to the state-of-the-art: 'Social chats and emotional communication appear to be used widely in private contacts over the Internet' (p.25). On media spaces he says: 'Advanced systems with large video screens can give the impression that people are actually sitting at the same table. Various systems have been developed at major research centres, such as Portholes, the system that connects Rank Xerox PARC and EuroPARC (Bly, Harrison & Irwin, 1993). (p.14)'. Newer technologies are mentioned but only in passing.

His treatment of theory is more comprehensive and ranges over Structuration Theory, Action Theory which is based on the work of Rasmussen, Situated Action Theory (which arguably is not a theory as such), Davis' work on Technology Acceptance Models and Engeström's treatment of Activity Theory. I think that Schmidt and Simone's research on articulation work/coordination theory

should have been included, and in general the links between theory and groupware were not as strong as they might be.

The final chapter on evaluation I found difficult. Andriessen has drawn on his work on the MEGATAQ project to present a neatly organised evaluation framework well populated with methods of assessing this and that but without highlighting the intrinsic problems of evaluation. Grudin, more than 10 years ago, drew our attention to 'the underestimated difficulty of evaluating groupware'. This is still true.

From the perspective of contemporary, academic CSCW, this book is lacking in a number of places. Starting with the index and bibliography, the 'usual suspects' of academic CSCW are conspicuous by their absence. The influential 'Lancaster School' of Rodden, Somerville, Hughes and others are missing, as are many of the widely cited US authors. Many of the major research strands and contributions of CSCW are also missing: no mention of workplace studies, ethnomethodology or CVEs. Instead Andriessen has accurately named his text. This book is indeed about groupware from the perspective of social and organisational psychology, just as it says on the cover.

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*Web Bloopers: 60 Common Web Design Mistakes and How to Avoid Them*
Jeff Johnson
Morgan Kaufmann, 2003
£32.95
ISBN: 1-55860-840-0

Jeff Johnson's *Web Bloopers: 60 Common Web Design Mistakes and How to Avoid Them* is part of Morgan Kaufmann's series in Interactive Technology and follows Johnson's previous book on GUI Bloopers.

The main premise of the book is that the web industry is being held back by poorly designed websites, which the average person finds frustrating and annoying to use, and this lack of usability is caused by a small number of common design mistakes.

The book sets out to analyse these common mistakes and offer solutions by illustrating good and bad examples from real websites. It is aimed at website designers and developers, and offers material to supplement existing web design guidelines. It is written in an entertaining manner and technical issues are explained clearly, which makes it accessible to a wider audience such as managers and educators.

The usability issues are arranged into three categories: content and functionality; user interface; and presentation. Johnson addresses the issue of content and functionality first as he sees this as the most fundamental aspect of web design to get right. Information architecture is not discussed in any great detail but suggestions are made on simple methods that can be used to organise the content of a website.

The section on functionality is the most interesting in the book and highlights the complex problems of designing appropriate front- and back-ends to a website, with good interaction between the two. This is a challenging area because the technical limitations of the web, in terms of its ability to represent transactions, make it difficult to create good task flow.

The section emphasises that a developer needs to have a task-focussed back-end before a usable interface can be created, and, in order to do this, task analysis and conceptual design are introduced. These concepts might be very familiar to HCI professionals but are probably new to many web designers and perhaps not seen as important by many managers.

Johnson also describes various technical solutions to the problem of transferring data between web pages, such as hidden forms, cookies, stuffed URLs and browser-based solutions but perhaps the more technical audience will be frustrated by these titbits. The section on the user interface looks at specific web issues such as navigation and searching and the more general issues of form filling. The final section looks at presentation but only briefly touches on graphic design and layout.

This book could easily have failed by falling into the trap, that Johnson himself mentions, of trying to be an expert in too many areas. It only briefly introduces the areas of interaction design, task analysis, technical writing, graphic design and technical implementation issues, but still works in a number of different ways.

Firstly, it is a good book to dip into and the examples will remind you of horror websites that you've had to grapple with. Secondly, it provides a good reference guide for developers, and checklist for evaluating a web site. Finally, although many of the web sites illustrated have been updated, the examples and categories provide a good basis for educational material, not just for web design but wider interaction design education.

The book is brave enough to offer its own website (***Web-Bloopers.com*** ) for criticism, which contains added material and a discussion forum (unfortunately however there were only seven registered users and few postings at the time of writing).

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*A Pattern Language for Web Usability*
Ian Graham
Addison-Wesley, 2003
£36.99
ISBN 0-201-78888-8

When I did a general search on Amazon.com to see if any interesting books about usability had been published this year, I found my eye being drawn to this publication. I became quite curious: I remembered learning something about patterns as part of my object-orientated module at university. I remember thinking at the time it was a good way to help solve recurring problems.

The book in question (like most other books on the subject of usability) offers the reader simple guidelines on how to make a website more usable, but what makes it different is the introduction of a checklist via a pattern language. The focus is on task-centred design, taking into account HCI ideas from psychology, software engineering, and knowledge engineering.

The book's intended audience are practitioners, such as web designers and managers of website development projects. For this reason Ian Graham has gone out of his way to make it simple and concise in both content and layout. At the same time, however, it is well referenced: the bibliographical section introduces the reader to a number of protagonists in the field – the usual suspects Nielsen, Norman, Schneiderman, and Spool et al are all mentioned.

There are some 79 patterns that make up the pattern language, each of which is presented in a easy to read problem and solution manner with

star ratings as to their importance. There are abstract as well as more concrete patterns, and because the book covers the whole development cycle of a web project, from understanding requirements to detailed design guidelines, there is a useful pattern for each of the stages which is very comprehensive.

The book contains only four chapters (the biggest being Chapter 3 which contains all 79 patterns). All but the most seasoned pattern readers will find the introductory first chapter hard going. The advice would be to skip this chapter and move on.

The author shares his own personal experiences in order to get across certain concepts – for example, the door handle teaser of bad design (although he does add that Donald Norman only 'documented the same phenomenon'). The book's simple conciseness is, I believe, also its downfall because it only touches the surface of some serious issues. Graham's response to usability testing, for example, is that it deserves a whole pattern language in itself – cue possibly another book 'A Pattern Language for Usability Testing'?

I certainly still enjoyed reading it, and would definitely use the book in web development. Knowing object-orientated programming or UML did help, but it isn't a prerequisite, because a general website containing tutorials accompanies this book to help your understanding (again though this fact might put off some readers!). A nice touch is that this site is working proof of the benefits of using a pattern language: the author used the content of his book to inform the development of the site.

At £36.99 this book certainly isn't cheap, though it is glossy and packed with a useful overview of such topics as use cases, extreme programming, and usability testing, all intricately woven into a pattern language. Contrary to the book cover though, I didn't find it lavishly illustrated with examples of good and bad websites, and in fact some of the illustration seemed quite eccentric! The next big question: should students fork out £36.99? Well, it is pricey, although if the university library budget will stretch, it would make a useful addition. As Ian Graham says, the 'perspective is unique'.

***Tripta Kumari***
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*The Elements of User Experience: User-Centered Design for the Web*
Jesse James Garrett
New Riders Publishing, 2002
£17.98
ISBN: 0735712026

According to the author "*The Elements of User Experience* attempts to impose order upon the chaotic array of terms and concepts currently being used to describe user experience development". The author is an information architect and describes the web as a hybrid of software interface and hypertext system.

The book has been received with gushing reviews from web professionals. 'Brilliant', 'an instant classic', 'a quantum leap in explaining user experience', 'the best book I have read so far about creating a great user experience' are just some of the accolades.

Reviewers have praised the book's brevity (208 pages), the sales job it does for their profession(s), and the famous elements diagram. The diagram does not define the web user experience but instead describes the building blocks for designing it. 'Strategy' is at ground level, with 'Scope' at first floor, 'Structure' at second, 'Skeleton' at third, and 'Surface' at fourth.

The author describes activities for each of the building blocks. Thus, Strategy comprises 'Site objectives' and 'User needs'. Scope is made up of 'Functional specification and Content Requirements', while Structure covers 'Interaction Design and Information Architecture'. Skeleton consists of 'Interface, Navigation and Information Design', with 'Visual Design' at the Surface.

Each of the five main chapters describes the issues and activities for each element and ends with a discussion of team roles and responsibilities. The author explains, 'this model, divided up into neat boxes … is a convenient way to think about the user experience … [but] in reality … the lines between these areas are not so clearly drawn … [and] some problems require attention in several areas at once'. Though it is packed with practical advice, for some reason the author does not see the publication as 'a how-to book'; rather the book presents 'the big picture'.

The quality of the writing comes from its genesis in the real world of commercial digital media design. Combine this with the author's conceptual clarity and the result is indeed brilliant. Readers (particularly managers and teams) will enjoy an easy read that provides a panoramic description of the web user experience.

Naturally, the book has its shortcomings. It's trendy and seems lightweight. Knowing the author's musical taste is cool but it trivialises the deep thinking behind the book. While the elements and activities are not new, the information has not been captured in one place or described so well.

The author defines the user experience in a rather narrow way: 'User experience is about how it works on the outside, where a person comes into contact with it and has to work with it'. Or: 'it is the often overlooked side of equation; how it works'. Such a definition could easily be applied to usability, in which case why redefine the wheel.

Garret has done a great job in demystifying web design. The book's elaboration of the elements diagram, from a web professional's perspective, makes it invaluable to development teams. It is not an academic book but it crystallises industry knowledge and experience. However, Garrett leaves understanding the user experience as a research issue for the future.

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Cfp: special issue of
*Personal and Ubiquitous Computing*
on multimodal interfaces

MULTIMODAL INTERACTION WITH MOBILE AND WEARABLE DEVICES

Editors: Stephen Brewster, University of Glasgow, UK and Matt Jones, University of Waikato, New Zealand

We are soliciting papers that discuss novel multimodal techniques, methods, models and tools to overcome the impoverished interfaces of the current generation of mobile devices. For further information or to discuss a possible contribution, please contact the special issue editors, Steve Brewster (stephen@dcs.gla.ac.uk) and Matt Jones (always@acm.org).

Submission deadline:
**26 January, 2004**

# What are the issues that face the HCI community on the dawn of the 17th national conference?

I have four children; the eldest, at 17, is the same age as the HCI Conference! At 17, daughters can be nice things to have; my daughter and I have endless conversations about the world, politics, relationships and education, and (very) occasionally the conversation turns to computers. Her view, not surprisingly, is that computers are about as interesting as microwave ovens. She cannot understand why anyone would want to study them, neither does she afford the home PC any significant amount of her time – in fact, she brags that she was able to go all the way through high school without ever logging on to the school system. Contrast that with the youngest of my children, a boy aged 7. When he was three he remarked that it would be cool if the computer printed out toys; at 7 he designs new screens and animates displays on the PC.

My eldest child has been heard to comment about how the world has changed since she was little (at 17 you can feel quite old!). She has noticed that her brother is completely at ease programming things, tweaking things, saving things, designing things on the numerous interactive devices that we have around the house; she, on the other hand displays a vague reluctance to meddle too much with game pads, interactive TV and GUI interfaces.

Marc Prensky (2001) describes these differences eloquently, referring to those of us who have adapted to the digital age as Digital Immigrants and those who are born into it as Digital Natives. My eldest, is probably one of the last digital immigrants, my youngest is almost certainly a digital native. Given that we as a community are almost certainly older than 17, we are probably also digital immigrants and for us one of our challenges is to begin to understand these natives, currently in school, but destined to be in the work place.

The upsurge in interest in designing for children is a welcome step forward, but there may be wider issues that need to be considered by the research community. One observation from my own work is that children readily and commonly attribute human characteristics to computers. They expect them to know things, to read things, and to think. This is probably in part due to the Microsoft blue sea into which they were born, where computers say they are sorry and where agents appear when they make mistakes. For us immigrants, our route to the blue sea was by a dense forest and possibly via a desert or two, and with that journey we gathered an understanding of the computer environment that our native population is not likely to have.

So, as the conference approaches the age of consent, we as a community need to take on these responsibilities; do we design interfaces that teach our natives to swim or do we throw them lifebelts. Does this mean that we need to de-humanise the computer?

*References*

Marc Prensky (2001) Digital Natives, Digital Immigrants, from *On the Horizon* (NCB University Press, Vol. 9 No. 5, October 2001), www.marcprensky.com

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I think one of the greatest challenges for the HCI community is to recognize and then to respond to the role that interfaces and interactions have in shaping values, opinions and personal relationships.

With e-commerce, the notion of brand entered the HCI lexicon. Far more importantly, as a result of, for example, e-government services coming online, the external face of individuals and organizations is becoming fused with a sense of accessibility and action at the level of the person (forget "user"). Rather than the sterile, vacuous economics of brand marketing, being a person on-line means being part of civil society. From an HCI point of view, this is a massive development.

The experience of interacting with other individuals and organizations through the web is almost exclusively to do with human–computer interaction. It's such a big opening, though, that lots of other professional groups have been immediately thrown into the breach, from creative designers to the UK government's social exclusion unit. This is a juggernaut that has been gathering speed for some time. It's an open question as to whether HCI professionals can tackle design at the level of the HCIs that govern our understanding of one another's on-line selves and, consequently, that fabric of the society within which we live.

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HCI is all about the user's needs. However, this doesn't always match the business's needs, so there are invariably trade-offs between the two. The task of making these trade-offs involves skills and experience from the business as well as usability fields, so neither side on its own can make such trade-offs effectively. Many processes or managers that are referred to as 'User Experience' don't have enough of an interest in the key business issues, and often don't even deal with them directly.

So for me a key issue facing business is how to build a framework and a system for handling these trade-offs. Consultancies like ourselves have been doing it for years, but trade-offs often get made round a table and are agreed for political reasons to avoid damaging egos and to try and get everyone's buy-in, rather than to find an optimal solution. This is a failing in the way companies are operated and will, I believe, be one of the parts of company structure that will radically change in the next 10 years as User Experience managers become more of an accepted requirement of all organisations.

The HCI community will be supplying many of these people, yet tends to encourage an inward looking and detail-focussed approach, whereas the future will require more of a focus on the customer and the bottom line. Those who are able to adopt these multiple viewpoints will be best equipped to lead the user experiences of the future.

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In a posting to the bcs-hci mailing list that invited people to contribute to *Interfaces*, I asked the question: "What are the issues that face the HCI community on the dawn of the 17th national conference?". I received a range of responses, including the four presented here. Other responses to the posting that addressed more general issues in HCI are printed elsewhere in this magazine. *Laura Cowen, editor.*

# My PhD

## Influence of visual design on eye movements

**Tony Renshaw**

I often wonder how a nice boy like me got involved with a project like this. I have come to the conclusion that it must have been a misspent youth and terrible good luck! I had originally intended to do something completely different like a one year taught MSc course on e-commerce at Huddersfield University, but somebody pointed me to Leeds Metropolitan University and a bursary to do a PhD – sounded too good to be true!

Before undertaking this research I had spent several years in industry as a user of big mainframe systems running in-house software applications, followed by several happier and more productive years using local PC applications running Microsoft Office products and numerous packaged accounting applications.

I have always been very interested in getting people to use computers and to see them as a useful tool and not as a threat. So I was delighted when the opportunity came up to do something different, upgrade my IT skills and enhance my knowledge.

Following an interview in the HCI department of Leeds Metropolitan University I started work. It was suggested, and I readily agreed, that eye-tracking may be an interesting and rewarding area. The research area also provided an opportunity to build upon the local University network whereby Leeds Metropolitan provided the bursary whilst Huddersfield provided access to their state of the art eye-tracking equipment and associated technical support.

Lest I forget, I guess I ought to attempt a description of my project that even I can understand. So here goes. I am interested in studying the influence of screen layout on the usability of a system: how people react to screen layouts, how that influences what they look at, and the order in which they look at it, how effectively they look at it and how satisfied they are with having to use it. To that end I am interested in the design and screen presentation of data, menus, text, diagrams, etc.

In my early reading on the subject it occurred to me that most of the work related to eye-tracking and usability reported how people moved their eyes in response to a screen display and I wondered whether designs could be used to influence eye movements in a more structured, or at least in a less obstructive way, so that information could be captured and processed faster, more accurately and less stressfully and thereby enhance the usability of the system.

My studies have taken me to areas that I did not imagine I would ever touch: psychology, statistics, physiology, vision science, information visualisation, as well as a bit of usability. I have even been allowed to conduct trials on real live and very patient participants!

The processes by which patterns, once detected, are converted into eye movements, which are then in turn captured and interpreted as indicators of usability, are gloriously, fascinatingly, complex. These phenomena have intrigued me for the last two years and look likely to for the foreseeable future.

I have been fortunate enough to have had enthusiastic and very patient supervisors, at both Leeds Metropolitan and Huddersfield, without whose help I would not have been able to structure my research nor write up two papers, subsequently published, with a journal article in the pipeline and an international conference to look forward to.

When it all works out it will have been a very different and rewarding three years!

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I attended and delivered a paper last week (July 11th–12th 2003) at the 6th International Workshop on Organisational Semiotics Workshop held at Reading University's Centre for Applied Informatics and Semiotics (http://www.cs.reading.ac.uk/ais/workshop/).

It occured to me that, apart from the efforts of Professor Alan Dix, who was also there from the 'mainstream' HCI community, we need to do far more to reach out to related communities of interest. For example, several papers at the workshop explicitly addressed semiotics of HCI!

Semiotics has been called the 'science of signs'. More specifically it is the discipline which connects meaning, meaning making, communication, and culture through an understanding of acts of signification. Typical forms of semiotic enquiry include textual deconstructional analysis, social and organisational investigations and analysis that seeks to better understand how users attach meaning to, for example, computer-based 'signs'.

Similarly, there are related communities of interest that exist within the Humanities areas too, which is why workshops like HCI, the Arts and the Humanities (http://www.hiraeth.com/conf/HCI-arts-humanities-2003/) are so potentially valuable.

However, there is perhaps a deeper challenge – there are a whole host of 'new media' folks out there who are engaging in many areas that we might consider to be the natural territory of HCI. How are we then to re-define the role of 'HCI' in the context of such initiatives without losing our identity and impact?

If we stray too far towards 'media' and 'humanistic' disciplines we may find it impossible to retain any sense of integrity with our industrial practitioners. However, to ignore such initiatives and instead hide within a traditionalist 'soft eng' HCI umbrella agenda might well be equally foolish in the long run.

Perhaps 'humanistic-centred software design and deployment' will be our role in the future. If so, we should also start exposing our students to such challenging notions as 'semiotics of HCI' – and perhaps in the process challenge our own notions of what it means to say "I'm an HCI expert/user experience consultant (or whatever)"!

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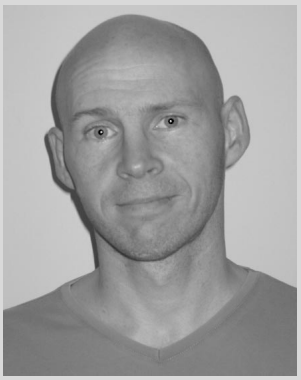
Read Tim's *The Semiotics of e-Commerce: Looking for New Insights* on http://usabilitynews.com/news/article793.asp

# *Profile* Eamonn O'Neill talks to Alan Dix



Eamonn O'Neill is a lecturer in the Department of Computer Science at the University of Bath. After a couple of degrees in related areas, he first got involved in HCI with his PhD research on participatory design. This work was supervised by Peter Johnson and George Coulouris at Queen Mary, University of London, sponsored by Harlequin Ltd under the EPSRC CASE scheme, and won the British Computer Society's Distinguished Dissertation Award.
After spells as an RA and then a lecturer in HCI at Queen Mary, Eamonn moved to Bath in 1999 as part of the migration of the erstwhile Queen Mary HCI Group from London to the University of Bath. Since then, he has played a role in developing the HCI Group at Bath, across the range of its research, teaching and industrial collaboration activities. The successful development of computer science at Bath in this period has seen the foundation of a new Department of Computer Science from its previous position within the nationally leading Department of Mathematical Sciences. In just 3 years, the Department of Computer Science at Bath, with HCI as one of its three major activities, has already reached number 6 in the Sunday Times ranking of UK computer science. Eamonn's current main interests are in mobile and pervasive computing, and he is gathering a collection of exciting young HCI researchers in this field at Bath. Eamonn's waking hours – and that means about 20 out of every 24 – are currently divided between calming his new son and chairing the HCI 2003 conference at Bath. He hopes to see you there, if he makes it to September.

*What is your idea of happiness?*
Looking out across the Cotswolds from the saddle of a bicycle on a blazing summer day.

*What is your greatest fear?*
Not doing or contributing anything useful.

*With which historical figure do you most identify?*
Alexander the Great. OK, so it's aspirational.

*Which living person do you most admire?*
My wife Karen. No, really. She always starts from an assumption that people are good and should be nice to each other.

*What is the trait you most deplore in yourself?*
Impatience.

*What is the trait you most deplore in others?*
Mendacity.

*What vehicles do you own?*
About 8 or 9 bikes and a Toyota RAV4.

*What is your greatest extravagance?*
My latest bike: Lance's frame but it's so much cooler with Campag components and a custom paint job.

*What makes you feel most depressed?*
HCI 2003. But I'm sure that'll change some time between 8th and 12th September.

*What objects do you always carry with you?*
Until recently, just a wallet and keys. Now I've added a 128Mb USB flash memory stick. Sad but useful.

*What do you most dislike about your appearance?*
I could do with a bigger nose.

*What is your most unappealing habit?*
Procrastination.

*What is your favourite smell?*
Mmm, probably roses.

*What is your favourite word?*
Summer.

*What is your favourite building?*
It's got to be a cathedral but which one? Overall, probably Durham.

*What is your favourite journey?*
I don't like travelling.

*What or who is the greatest love of your life?*
My wife Karen.

*Which living person do you most despise?*
I'd have to invent an answer, so I guess that means no one.

*On what occasions do you lie?*
When completing questionnaires.

*Which words or phrases do you over-use?*
Bollocks. (Are we allowed to say that in Interfaces?) [why not? Let's be edgy! -Ed]

*What is your greatest regret?*
I have a few but then again too few to mention.

*When and where were you happiest?*
I get bursts of great happiness frequently, often when walking around the end of our village, looking out over the fields and contemplating how beautiful it is.

*How do you relax?*
I don't do relaxed.

*What single thing would improve the quality of your life?*
Broadband internet to my home.

*Which talent would you most like to have?*
A really great singing voice, instead of the pretty awful one I've got.

*What would your motto be?*
"What shall we try next?"

*What keeps you awake at night?*
You're kidding? My baby son Eoin who thinks that screaming is what the hours between 2 and 8 am were intended for.

*How would you like to die?*
With plenty of time to think about it.

*How would you like to be remembered?*
Eamonn who?

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We are always looking for people interested in contributing to HCI group activities by, writing for Inter*faces* magazine, helping run the annual conference or joining the executive. If you are able to contribute in this way or if you have ideas for 1-day meetings or new activities please contact the membership secretary, Peter Wild (peter.wild@acm.org; Fax. +44(0) 1895 251686).

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The HCI Group manages a journal, *Interacting with Computers*, published quarterly by Elsevier Science. Members may subscribe to this journal at a reduced rate.

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