Interfaces

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British HCI Group
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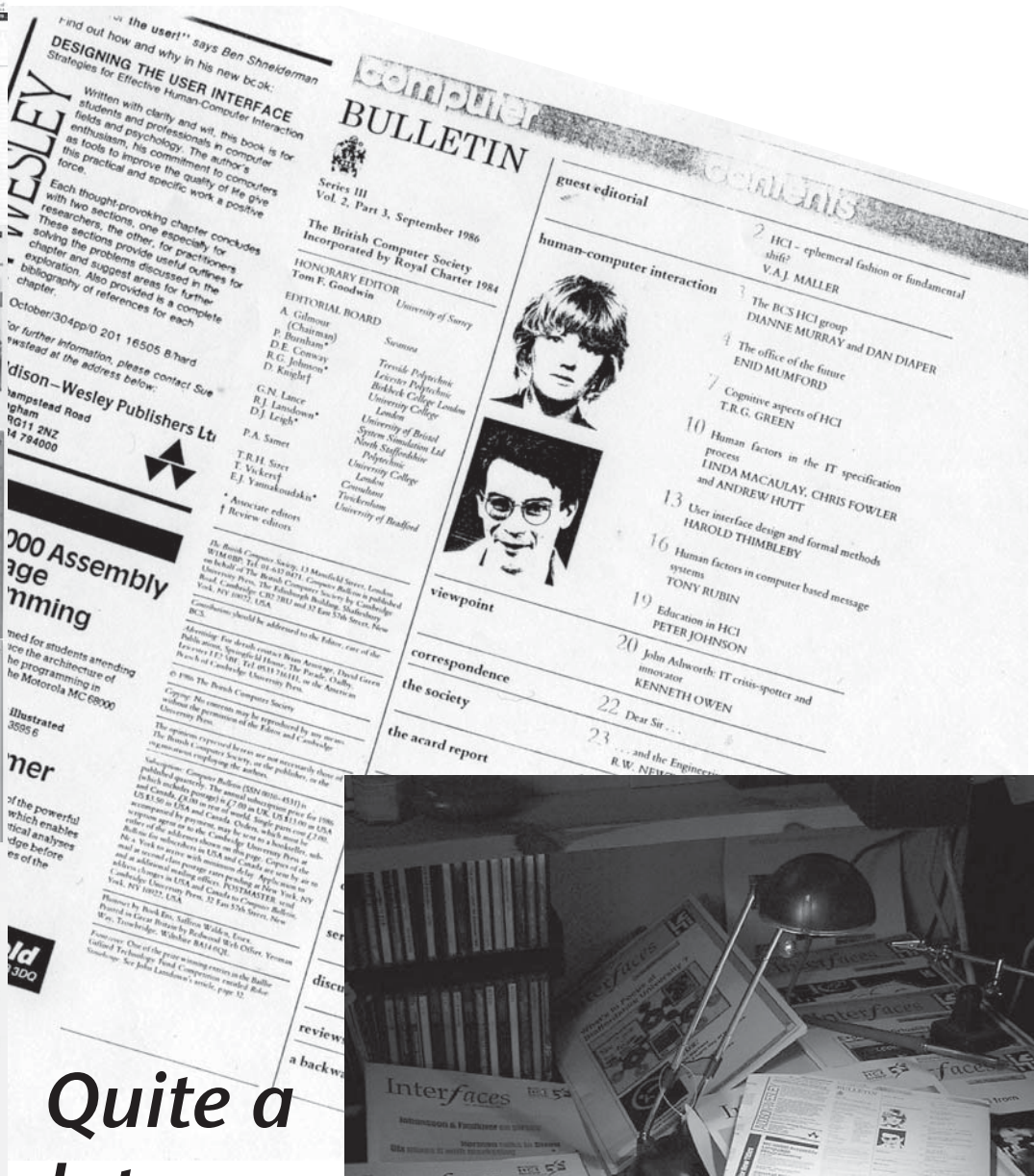
Fifty issues of Interfaces and 16 years later – how much has changed?



Quite a lot ... and not a lot!

Bumper Golden Jubilee Edition

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Human–Computer Interaction

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View from the Chair

Make a Difference

Nothing is achieved without resources. Your valuable annual subscriptions are a key resource for the British HCI Group. When combined with other income from services and events (especially some substantial conference surpluses), the group's funds enable a range of worthwhile activities. However, ample as our reserves are, they are not our most valuable resource. You are.

We are a volunteer organisation, run by volunteers for the greater good of the practice and discipline of HCI within the UK and beyond. What we can achieve for practitioners, educators, students and researchers, as well as for users and system commissioners, is largely limited by the time that members can volunteer. If BHCIG aren't doing something that you think we should be doing, there are two possible reasons. Firstly, no one has suggested the activity or initiative to a member of the Executive Committee. Secondly, no one has volunteered to champion the idea. The latter is more common than the former. The Executive Committee have always been aware of dozens of things that should be done. What we've lacked until now is a volunteer recruitment drive. If you've read so far, then there's no escape. BHCIG needs you!

We need collaborators as well as volunteers. We have recently worked effectively with several UK organisations to present a UK position on professional accreditation for HCI. As Brian Sherwood Jones' letter in this issue notes, we must work with other established UK groups to improve the practice and discipline of HCI in the UK and beyond. However, we need BHCIG members to liaise with these groups. Where we are the best home for new activities, then we need more members to volunteer time.

So, make a difference. Let me or an Executive Committee member know about things we should be doing. Better still, volunteer some of your precious time to champion new initiatives and activities, and work with other volunteers to make the world a safer place for computer users! The Executive Committee will be watching their inboxes with bated breath. Don't disappoint us. If things need doing, volunteers need to get them going.

Gilbert Cockton
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Editorial

In 1986 the BCS published a special issue of the *Computer Bulletin*, focusing on HCI. Fifteen years later, how much has changed? In the opening piece for this 'golden' 50th issue, I hope I set the scene for the rich collection of content that follows, in particular the responses from key HCI figures to our questionnaire on the future and past of British HCI.

Dianne Murray has provided a thorough history of the journal *Interacting with Computers*, outlining the key contributors, and Dan Diaper has stepped into the Vet's shoes to provide us with a history of the rise and fall and rise of task analysis.

Xristine Faulkner's review of *The Myth of the Paperless Office* reminds us of the staying power of simple, effective, trusted technology.

Nico Macdonald reviews the up-to-the-minute TiVo, which puts users in control of technology by giving viewers the opportunity to control what's broadcast; he also provides an insight into the sophisticated marketing and design work that goes into modern product development.

Cath Dillon looks further forward to a time when we can participate directly in TV programmes as we watch them, and beyond that to a time when TV will become an enabler of 'presence' through which we can communicate with others; she also describes the state of the art in tapping human affective responses. This work is new since 1986 and as it progresses we will see the barriers between people and technology dissolve; as they say 'down the Elephant': Memorable Yet Invisible.

Already a seminal figure by 1986, Andrew Monk is still hard at work and contributes another of the legendary 'Noddy Guides' – making HCI itself usable!

I'm very pleased to share the news that the irrepressible Tom McEwan, *Interfaces* Editor, has made a rapid and strong recovery. He will reclaim his place in the Editor's chair for the next issue, and will warmly welcome any contributions you may wish to make to that issue.

I'm honoured to have been invited to step in as acting editor of this special edition. I thank Tom for his unselfish, enthusiastic and encouraging support over the last few months as I've worked on this issue. I also thank *Interfaces* production editor Fiona Dix for her efficient, thorough and devoted work on this issue.

Alex Dixon, acting editor

UsabilityNews.com now allows inclusion of its headlines on your own site: see *Syndicating your content on the web* on page 14

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 April**, but don't wait till then – we look forward to hearing from you.

with thanks to commissioning editors:

Vet's Guide: Alistair Kilgour, alistair@realaxis.co.uk
Learning and Doing: Alex Dixon, adixon.hci@ntlworld.com
Book Reviews: Xristine Faulkner, Xristine@sbu.ac.uk
My PhD: Martha Hause, m.l.hause@open.ac.uk
Profile: Alan Dix, alan@hcibook.com

Deadline for issue 51 is **15 April 2002**. Deadline for issue 52 is **15 July 2002**. 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 Tom McEwan, School of Computing, Napier University, 219 Colinton Road, Edinburgh EH14 1DJ
Tel: +44 (0)131 455 4636; Email: T.McEwan@napier.ac.uk

and copy email submissions **to Fiona Dix, *Interfaces* production editor; email: fiona@hiraeth.com**

±15: Plus ça change

September 1986. The BCS *Computer Bulletin* devotes a special section to highlight the existence of the BCS HCI Specialist Group. The group had been formed two years earlier to 'encourage a multi-disciplinary approach to systems design and to stress the importance of taking the user into account during the design process,' as Murray and Diaper report in their article in that bulletin.

March 2002. The 50th issue of *Interfaces* is published, our 'Golden' issue, and Murray and Diaper are here again. At a time when the Queen's Golden Jubilee prompts the public to reflect on her reign of the last 50 years and to ponder what the future may bring, so we in the HCI community are prompted to review what we have achieved during the last 15 years and to consider what lies ahead for us.

Other characters who are known in our community today also featured in the 1986 magazine: 'A more recent book is Norman D. and Draper S.W., *User Centered System Design* (1986)'; 'Dr Nigel Bevan, chairman of the BCS Human–Computer Interaction group'; Peter Johnson, then of Queen Mary College, London, wrote about 'Education in HCI'; Harold Thimbleby, then at York, wrote about 'User interface design and formal methods'. Looking back over the history of the last fifteen years we find a certain continuity in the human side of our story, and also in the topics of debate.

The computer story is different: the technology has changed dramatically! It's easy to forget just how great the change has been. In the 1986 magazine I read about the BBC's Domesday project, which is presented on 'an Acorn Master Turbo microcomputer and trackerball'. Machines such as the IBM PC were 'to follow'. No Windows, no Word. The data for this project would be 'returned to the Domesday headquarters in West London, where a Vax 11/750 is used for compiling the information. Each side of a Laservision disc is 330 megabytes: building Domesday files can take five days of processing!' Another article gives a lengthy assessment of the dangers of working with VDUs: 'evidence is incomplete although medical opinion suggests that there are no inherent risks in VDUs'. In 2002 our government has recently commissioned extensive research into the hazards of using now ubiquitous mobile phones: does our technology harm us? The technology has changed, but the human issues it raises have not.

In the UK the use of text messages has rapidly reached bewildering levels, with more than 260 billion SMS text messages sent last year. A number of contributors to the survey in this issue have noted that UK HCI practitioners are well placed to lead the work on mobile HCI. One feature of txt msgs, which has contributed to their popularity, is the rise of emoticons :) This illustrates the human need to express emotion along with facts and information, even when working with an interface that is so unfriendly it offers us only a number pad to write text. With the right motivation human ingenuity overcomes the limitations of technology.

Have we HCI experts failed to convey the message that technology must adapt itself to humans? Enter Dean Kamen's Segway™ Human Transporter, announced in December 2001, which 'transforms a person into an empowered pedestrian, allowing him/her to go farther, move more quickly and carry more than could ever be achievable walking'. The transporter 'functions like an extension of you; like a dance partner able to anticipate your every move. It uses powerful motors and high-speed computer processors to mimic human equilibrium.' This technology 'changes the way you work, shop, commute, and explore, it also gives you the power to change the world around you. Some of these changes will affect your neighborhood, some will affect the world at large.' Here we have a technology that has been so moulded to fit the human being, that our familiar urban environment must change to accommodate our enhanced selves. People who use the HT will not knowingly interact with the computers that are one of its essential components. So where does that leave HCI specialists?

In his 1986 guest editorial Maller suggested that 'commercial success will come to those who fashion their artefacts so as to achieve not only effectiveness of action but the best possible match, both physically and mentally, to the human user and to the tasks he wishes to perform.' It will be interesting to see if Kamen has achieved this with his 'new category of human transportation', supported by his fifteen separate specialist teams – including the user interface design team, embedded design team, industrial design team, and sales and marketing team. Certainly, he has taken the product development process forward in a way that the TiVo has not. This style of multi-disciplinary co-operation seems set to be the dominant development model for the future.

Interestingly, where Maller considers both the physical and mental needs of the user in 1986, Kamen's 2001 device also meets the user's emotional needs: 'That's what happens physically. Emotionally, it's like the childhood dreams you had where you could fly. You feel freedom, exhilaration, and confidence.' The new area of research into affective computing, pioneered at MIT and with a growing number of British researchers, will become increasingly important as the barriers between humans and computer-based devices dissolve.

In their survey responses in this issue Alistair Kilgour and others foresee that HCI will cease to exist as a separate discipline in the next fifteen years but rather become an integral part of the design process. Maller noted in 1986 that 'there is not yet widespread acceptance that the understanding of the human computer interface and the interaction across it represents a central and crucial aspect of systems engineering.' We have made progress! But this progress may necessarily lead to the disappearance of our special branch of ergonomics. Maller noted 'a tendency to subordinate the topic [MMI] to other enabling technologies such as software engineering and artificial intelligence'. In 1986 this was a criticism of the lack of attention paid to HCI. However, today this is rather a sign of the discipline's maturity. HCI is dead! Long live HCI!

Maller insists that 'This knowledge [...] must be presented in such a form that it will be accepted by systems designers as a natural part of their professional brief and not merely remain the arcane preserve of the HCI cognoscenti.' This trend puts great emphasis on the value of finding effective ways for HCI experts and system designers and developers to communicate fluently, a topic which Chris Rourke investigates in his report on the UML Symposium in

Scotland. There's a promising future for this kind of research into effective communication.

Kamen has demonstrated that technology can be moulded to suit people, and that such moulding can in turn change the nature of the interface between people and technology. At last people really are put first – hooray! However, Maller cautioned us in 1986 that changing people is not so simple: 'Although the multi-disciplinary nature of studying human computer interaction is accepted, the cultural and attitudinal problems associated with integrating applied psychologists and ergonomists into groups of electronic and computer engineers now has to be faced.' Some things don't change, as you'll discover when you read Kit Logan's present day account of his PhD work in this issue – he shares with us his own experience of the difficulties of inter-disciplinary communication! Plus ça change!

Information about the Segway™ Human Transporter is from http://www.segway.com.edgesuite.net/consumer/

Alex Dixon
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Letters to the editor

Dear Editors

Regarding 'The future of online shopping: a small survey', in *Interfaces* 49 (by Ibrahim & Faulkner) …

For an even smaller survey and an example of the service experienced by one customer, your readers might be interested in Philip Powell's account of his attempt to shop online, in the *UKAIS Newsletter* of September 2000.

This may be found at *http://www.cs.york.ac.uk/cgi-bin/ukais.cgi?f=vol6no2#B2C* (or *http://www.ukais.org/* then select 'News', 'Volume 6, Number 2' and 'B2C – the new digital economy').

Regards

Tom G. Gough
School of Computing
Leeds University

Dear Editors

Gilbert Cockton's first aim as chair seems to include challenging false stereotypes recently imported into the UK and is to be welcomed as an opportunity to define the professional context for the Group and its interfaces. His third aim, of re-establishing member benefits that have slipped, is perhaps slightly disingenuous. The academic 'land grab' for the HCI SIG in the mid-1980s set the tone for the group ever since, and the conference Industry Day has a distinct air of tokenism about it. As a practitioner, I am not aware of having lost any benefits, but rather suspect they were never there.

Two informal indicators may be relevant to distinguishing accurate and false stereotypes.

1 Of the 17 posts on the back page of *Interfaces* 49 that could be either academic or industrial, 13 are held by academics.

2 At HCI 2000, Timo Jokela asked his audience how many had heard of the standards that underpin good practice in this area (e.g. ISO 9241, 13407, 18529, the Common Industry Format); very few hands went up. He asked about major developments in software practice such as CMM. Again, very few hands.

If people concerned with the professional application of HCI are to take a Pride in their work, they need to be up with best practice. To what extent does HCI research and teaching take account of this? For an overview of what might be considered best practice, the reader is referred to the papers by Bevan and by Earthy et al in *IJHCS* 55, 4 Oct 2001 (I confess to being one of the al in the latter). If researchers feel that they are above or beyond best practice as defined in recent standards, and that this inhibits good work, then publishing evidence in support of such a claim would be a professional priority. There are also opportunities to comment on drafts and updates of standards. If 'real HCI experts' (whatever they are) are to take on 'Terence from Telford (age 19 3/4)' and other 'gold-diggers', then experience in 'best practice' has to be one of the first lines of defence (or attack), and the indications at the moment are far from promising.

At the moment, there is no obvious home for the practitioner in user-centred IT design (and 'home' ought to include professional accreditation). In the UK, the Ergonomics Society (ES) is the logical choice for many. It is a very broad church, and the British HCI Group offers a useful technical focus as a second home. The ES offers a professional accreditation scheme, and hopefully will continue to offer an alternative to the Eur.Ergs scheme. However, the professional stakeholders' organisations also include the IEE (especially now with the Professional Network in Human Systems Engineering), and the British Psychological Society Occupational Division offers professional status on the change management/HR aspects (and would offer considerably more if the Engineering Psychology initiative had been given more support).

I am afraid I am not up to date with what happened to the BCS moves to accreditation in user-centred design. The inclusive approach being taken by Jonathan Earthy to accreditation is clearly necessary. A number of the above organisations have their own regional groups, intended to provide a local 'home' for people, including (or perhaps especially) practitioners. In addition, there are other technical networks such as First Tuesday or INCOSE that demand attention. Cumulatively, the situation for the HCI practitioner makes the UK rail organisation look quite straightforward. The viability of the proposal in the 'View from the Chair' to get practitioners to revive yet another meeting forum needs careful thought. Greater collaboration, and common meetings programmes (especially at a local level) would allow each organisation to do less, better, for a larger community. In addition, practitioners these days are all too aware of globalisation, and 'home' needs to be part of an international network.

On this basis, the 'further division' posed by the Unidentified Prospective Adversary can hardly be considered significant. The constructive approach proposed by our new Chair is greatly to be welcomed – there is much truth in the web axiom 'network or die'. In this context, the inclusion of an EUPA theme in the conference is to be applauded as a positive way ahead. (The only thing missing from the conference seems to be a visit to the Griffin Brewery at Chiswick.)

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Dear Editors

Brian Sherwood Jones' letter was a great boost to my ego (no jokes please), as it showed that someone actually reads the Chair's column in *Interfaces*. To further welcome the column as an opportunity to define the professional context for the Group and its interfaces was more than I could have wished for. Given that, I'll

forgive him the exquisitely veiled 'perhaps slightly disingenuous'. I've not been called this since my Greek teacher uncovered one of my ruses over a quarter of a century back. So 'οπισφυλακω to you Brian!

Moving from Greek to History, Brian's awareness may be restored by the reminder that he spoke at a BHCIG meeting when I was meetings organiser back in the late 1980s. For the first decade of the group's existence, meetings organisers ensured that practitioner presentations were included in all meetings. Worthy practitioners such as Jonathan Earthy still sing the praises of these meetings.

Moving from History to Sociology, Industry Day should have no whiff of tokenism since it rose and fell with practitioners. Rory Channor set it up in 1996 to let practitioners attend the conference for a single day. John Cato, Peter Windsor, Mary Jones and Ian Curson kept it going until practitioners complained in 2000 that one day wasn't enough for them any more. In 2001 UPA UK were involved in a three day practitioners' track, which was the forerunner of the 2002 EUPA co-operation.

To continue with the reality of the British HCI Group, of the 17 posts on the back page of *Interfaces* 49 that could be either academic or industrial, 13 have academic email addresses. They are not all academics and those who have academic posts often have significant consultancy experience with good repeat business. The same is true of university-based pharmacists, doctors, artists, architects and a whole range of practitioners who just happen to work some of the time in a university.

As for HCI standards and shows of hands at presentations, how many hands could have gone up? Perhaps the standards experts were at another session at HCI 2000! As it is, the Executive Committee recently recommended finding a speaker on standards for the annual HCI Education meeting in March. All suggestions will be gratefully received, as will ideas on affordable routes to stocking university libraries with multiple copies of relevant standards and pointers to good tutorial material that can be used to support teaching. Current HCI text books offer little support for teaching about standards.

I agree with Brian that experience in 'best practice' has to be one of the first lines of defence (or attack) against usability imposters. We need members to volunteer to champion relevant standards in *Interfaces* and *Usability News*, since both these can keep educators updated on current trends.

So, enough of the rebuttals, let's focus on defining the professional context for the Group and its interfaces. BHCIG has always worked with other relevant organisations. The inclusive approach being taken by Jonathan Earthy to accreditation is not only clearly necessary but was agreed at the October meeting of the Executive Committee of which Jonathan is a member. In January we provided support to ScotlandIS with their UML and HCI meeting. In April, we are providing support to the Edinburgh Science Festival through sponsorship for Jared Spool's lecture. We are in discussion with UPA UK on joint meetings (their successful programme is run by an academic, so there's no escaping the land grab!). We have no intention of duplicating meetings programmes where good ones already exist. Wherever possible, we will work with other organisations to further the practice and discipline of HCI.

I hope, however, that what I've written above is not good enough for BHCIG members. We can and should do more for the cause of good software design. To do this we need ideas and volunteers, so do keep this discussion going through the usual channels of *Interfaces*, email to the Executive Committee and articles in *Usability News*.

Gilbert Cockton
Chair, British HCI Group

Who's afraid of the mouse?

Plans for HCI 2002, at South Bank University, Elephant & Castle, London 2nd–6th September, are already well advanced. Around one hundred eminent reviewers are currently considering the scores of full papers submitted by January 16th. The decisions on these will be made in late March.

Already confirmed are the keynotes and the big social event of the week.

Former chair of the British HCI Group Andrew Monk (*http://www-users.york.ac.uk/~am1/*) needs no introduction to readers of this magazine. Well known for the annual Computers & Fun meetings, now in their fifth year, Andrew's publications date back to 1976, before anyone had thought of putting the letters H,C, and I together, in any order (save to capture the essence of half a panda). When not advancing human knowledge, Andrew is a frequent diner on the Kings Cross train.

Wendy MacKay of INRIA (*http://www-ihm.lri.fr/~mackay*) was a huge hit at Interact'99 with a highly successful tutorial day, on using video to establish requirements. *Interfaces* was much struck by her innovative use of post-its. Wendy's HCI history covers more than twenty years, with Digital, MIT and RankXerox EuroPARC before she became a professor at Paris in 1995.

Our final keynote is legendary R&B figure Les Hatton (*http://www.oakcomp.co.uk/Presenter_LH.html*). Les is author of *Safer C* and an entertaining speaker who will give an interesting and different slant on HCI issues. Once described as 'one of the world's leading 15 scholars of systems and software engineering', some of you may have heard him at ITiCSE 2001. Duelling harmonicas seems an inevitable finale.

HCI 2002 will cover all main areas of HCI research and practice, but will focus on the conference theme of 'Memorable yet Invisible'. This theme is explored in more depth on the website, but briefly: how do we make systems memorable enough to be easy to use, without making them obtrusive? Are we trying for transparency or invisibility? Is the fundamental dichotomy between the need to make something engaging, compelling and noticeable (e.g. high tech or state of the art solutions), and making things transparent, natural and intuitive?

Submissions on all areas of HCI and usability are invited, but you are strongly encouraged to address the new challenges posed by the theme, before the deadline of 1st May.

The UK Chapter of the Usability Professionals Association is co-locating European UPA 2002 in conjunction with HCI 2002. The EUPA conference is looking for presentations, panels, tutorials, and workshops. You can find a fuller list of topics on the website including: innovative usability methods, accessibility and social acceptability, the role of usability in the product lifecycle, business case studies, influencing management, and usability trade-offs. Other areas include design processes and methods, concepts and philosophies, and working with experts from other fields. The deadline for presentations and panels was 28th February, while proposals for workshops can be submitted up until May 1st.

And the social highlight is confirmed as a trip to The Globe Theatre (*http://www.shakespeares-globe.org/home.htm*) to see A Midsummer Night's Dream. Tickets will be limited to the first 270 delegates to sign up for the conference, with an equal split between the amazing experience of standing with the commoners, and seating for the more aged members of the HCI community. An alternative event will be arranged for delegates who do not book their places in time.

Information about both conferences can be found at the snappily titled *www.hci2002.org/*.

Tom McEwan

A Brief History of The Interdisciplinary Journal of HCI

Dianne Murray

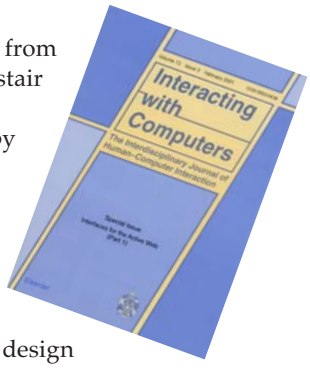
One of the undoubted early success stories of the British HCI Group (formerly known as the BCS HCI Specialist Group) was the creation of a new academic journal, named *Interacting with Computers*.
A brief history of the journal relies heavily on certain individual stories: from Dan Diaper as the first general Editor of IwC, from Dianne Murray as the first HCI Group Newsletter Editor and Deputy Editor of IwC, from Russell Winder as BCS Publications supremo (well, for a while anyway) and from Nigel Bevan as the first HCI SG Chair. Here's Dianne's story.

We knew there was a viable market for a different type of academic journal: one not focused on Ergonomics or Cognitive Psychology or Software Engineering but with a definite applications and practical bias, and publishing up-to-the minute and innovative work. After much soliciting of publishers' proposals, negotiation of contracts and debating (and frequently insisting) the nitty-gritty of what the journal would actually look like, IwC came into being in the late 1980s.

We insisted on a distributed management structure, consisting of three editorial boards in Computer Sciences, in Human Sciences and in Applications. These Special Editorial Boards (SEBs) are still, today, the backbone of the journal's management and paper processing mechanisms. All was overseen by a General Editorial and Management Board (GEMB), which, in retrospect, looks a little top-heavy but was certainly inclusive. In addition to the editorial team, we had a chair of each SEB and a representative from different parts of the world in an attempt to be truly international. I would like to pay tribute to those initial GEMB members for the amazing amount of hard work they put in during those first years: most especially to Gitte Lindgaard (Australasian rep.), Michael Wilson (European rep.), Tom Hewett (American rep.), Roy Rada (CS SEB Chair), Karmen Guevara (HS SEB Chair) and Paul Booth (Production Editor).

The selection of the first members of the editorial boards was, as I recall, no easy task, but I am pleased to say that we have many of those original SEB members still with the journal today and still working extremely hard to ensure its success. A great many thanks are due to the following individuals: Ruven Brooks, Dermot Browne, Jonathan Earthy, Marilyn Mantei, Tom Carey, Ernest Edmonds, Jonathan Grudin, John Long, Andrew Monk, Jakob Nielsen, Jenny Preece and Mary Beth Rosson.

The first issue of the journal was published in April 1989 by Butterworths, who were then part of the Reed International publishing group. IwC, with its striking and simple beige and blue cover was, from the onset, identified as The Interdisciplinary Journal of Human–Computer Interaction, and was designed to be very reader-friendly with clear layout, type font and citation information, and of an easy size to photocopy and stand on display shelves.



The articles in Issue 1/1 ranged from the topics of Task Analysis (by Alistair Sutcliffe) to User Models (by Rod Rivers) to the morality of design (by David Pullinger) to Lean Cuisine notations (by Mike Apperly and Bob Spence) to icons (by Yvonne Rogers). Contrast this with the contents of the latest issue (14/1) with articles on Activity Theory (by Phil and Susan Turner) to web design (by Jaspreet Ahuja and Jane Webster) to UIDE (by a research team too numerous to mention) to, strangely enough, design using Lean Cuisine + (by Chris Scoggins and Chris Phillips).

In the intervening years we have successfully weathered many storms and changes. We are now published by Elsevier Science as the consequence of commercial take-overs, we have had a change of Editor and Deputy Editor with Dan Diaper now being formally Editor Emeritus and with a very much reduced GEMB. We have grown to be an extremely successful and well-respected journal with an excellent impact factor and citation profile and a growing reputation for excellence, as evidenced by the large number of hits and downloads of the electronic versions of IwC papers. We have a wide-ranging, and highly topical, set of journal special issues, and have a very hard-working and committed SEB membership in the international HCI community. We have published papers, not just from the HCI bases of the UK and North America but also, increasingly, from Australia and New Zealand and from new centres of HCI interest, in Africa, South America and the Far East.

This could not have been achieved without the assistance and continual support of many people, some of whom deserve special mention: Dan Diaper, of course, and Karmen Guevara especially. In particular, IwC would not be what it is today without crucial input from Russell Winder, Michael Wilson, Gilbert Cockton, Roy Rada and the enduring support of HCI luminaries such as John Long, Jim Alty & Ben Shneiderman.

For now, we intend to continue our stated aims: to act as an international forum for the discussion of HCI issues, to foster communication between academic researchers and practitioners, to encourage information flow, to stimulate ideas and to have a strong, forward-looking perspective.

For information on the journal and instructions for submissions and refereeing procedures, or sample copies, please go to the journal home page (*http://www.elsevier.com/locate/intcom*).

Please feel free to contact me on anything to do with the group's journal.

Dianne Murray
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Vet's diary

Waves of Task Analysis

'... the next issue of *Interfaces* after this will be number 50. For that issue Dan will take over this column (though he says he is not ready to be considered a veteran!) for a personal retrospective on the rise, fall and renaissance of task analysis. ... rather thinly disguised commercial ...'
Alistair Kilgour, (2001, *Interfaces* 49).

My thanks to the British HCI Group (BHCIG), *Interfaces*' editors and Alistair, but you really shouldn't give a monkey the keys to the banana plantation. I also thank Alistair for his plug for the forthcoming issue of *Interacting with Computers*, where I (Diaper, 2002a) review Jack Carroll's (2000) book on scenario-based design, and which contains further commentaries from the great and good on scenarios and task analysis. As for Alistair's last four words, I think my plug for the forthcoming, 700+ pages, *Handbook of Task Analysis for Human—Computer Interaction* (Eds. Diaper and Stanton, 2002b) is relevant, appropriate, useful, etc., and absolutely undisguised.

"Goodness gracious," I thought on receiving Alistair's invitation to write this *Vet's diary*, "I must have missed the fall of task analysis." Then I thought, "Naaah." I think Alistair's wrong and task analysis has never left us. Understood properly, it is at the heart of nearly all HCI research and virtually all applications of HCI in real systems development. Often it may not be called 'task analysis' but, I claim, that is what it is.

The true pedant will notice that Alistair asks me for 'a personal retrospective'. This is undoubtedly much easier than dispassionately charting the history of task analysis from, say,Taylor (1912).

So to start my own story of task analysis, I was introduced to it by Peter Johnson and John Long in December, 1982, when I joined the Ergonomics Unit, University College London. I'd recently finished my Ph.D. in the Department of Experimental Psychology, Cambridge, and this was my transition from pure to applied psychological research. The study of the human mind had already made me mad by this time, and the divine passion continues to this day.

Coming out of the Ergonomics and Human Factors communities, HCI in the early 1980s was perhaps more narrowly focussed on the task concept, of what people do, than has subsequently been the case. The methods Hierarchical Task Analysis (HTA) and GOMS (Goals, Operators, Methods and Selection rules) were available then. Peter, John and I wished to specify training requirements for a national IT training syllabus using task analysis. What we were interested in was identifying transfer of training across tasks and application domains. GOMS didn't seem very suitable for this as we wanted almost the opposite of key-stroke level models, i.e. usable, generalised knowledge acquired from training. Peter was familiar with HTA, but I felt that it was too sloppy as a method and its claimed modelling of psychology offended my purist, scientific attitude. I recommend Andy Shepherd's spirited rebuff of this sort of criticism of HTA (e.g. 1989; 1998).

The monster, Task Analysis for Knowledge Descriptions (TAKD) method, was born in early 1983. The acronym was Peter's and it's one of the two things I still blame him for over our twenty year friendship. The other was my two person stag night, he and I, on December 6th, 1985, where Peter did the staggering and I poured him into the last taxi in the City of London early on my Wedding Morn and was thus left stranded, miles from home. Still, I've been happily married for over 16 years and it could only have got better given how it started later that morning.

Peter, John and I worked on TAKD and others around the world created other methods so that by 1986 Wilson, Barnard and McLean, all of whom I'd known from my Cambridge days, could report the availability of a dozen task analysis methods. There were various conferences and workshops on task analysis throughout this time, including one I organised for the BHCIG, although the group wasn't called that then, in 1989. My edited book's chapters (Diaper, 1989a) formed the basis of this one day event. Also, well into the 1990s, I regularly did a one or half day tutorial on task analysis at the Group's annual conference.

Now, what about this fall stuff of Alistair's? Well, it seems to me that the critical issues associated with task analysis that I considered important, circa a dozen years ago, are the same ones I am confronting today.

While I've worked on many things over the last twenty years (see my C.V. on the Bournemouth University web site for a list of about 30 topics and all my publications' references), I continued in my terrier mode, doggedly using and investigating TAKD until about 1997.

In the early 1990s we, Mark Addison and I at Liverpool University's Department of Computer Science, built a serious TAKD CASE tool, LUTAKD, and I used TAKD and LUTAKD for all sorts of purposes, not all of them to do with task analysis. The history of TAKD and my eventual requiem for it can be found in my recent paper (Diaper, 2001a). Do please note, I am not recommending TAKD to people these days.

"But what are these continuing critical issues of which you write, Professor Diaper?" you may well ask, ignoring that 'but' is a conjunction.

"Hmmmmm," says the mad Prof., "that question requires a very complicated answer."

"Groan," you all go.

At the heart there is the problem, I think, that the HCI community continues to be riven by two views of what the HCI enterprise is about. On my side (e.g. Diaper, 1989b; 2001b) is the broad view that HCI is about everything to do with people and computers. The narrow view, which in black moods I fear is more prevalent, is that it is about user interface design and usability.

Perhaps more than anything else in HCI, the task analysis arena illustrates this divide. The fundamental, but unfortunately popular, misconception about task analysis is that it is only suitable for the detailed analysis of well-defined, extant tasks. Nor do these differing views of HCI and task analysis neatly divide between academics and industrial

practitioners, although there might be a case for suggesting a transatlantic bias with more of the Westward favouring the narrow view.

To illustrate the narrow view, recently I received the first review from a publisher about our new *Handbook of Task Analysis for Human—Computer Interaction* (Diaper and Stanton, 2002b) that was not overwhelmingly positive. The anonymous reviewer wrote, more than once, of 'the task analysis method'. The 'the', to my mind, makes this nonsense, and the anonymous reviewer clearly meant it. It's akin to talking of 'The HCI Method'.

For a start, there are a plethora of task analysis methods, many being developed or refined in the 1990s. These methods have been developed for different purposes, use different sorts of data and are differently suited for different application domains. There is no adequate classification of tasks, their components, etc., that is domain independent. Indeed, I don't think there is even an adequate taxonomy of methods. A number of chapters in Diaper and Stanton (2002b) will address these issues.

One can go further, e.g. Shepherd (1998), and suggest that there is no adequate, widely accepted definition of what is meant by a task. I pointed out years ago, however, that people don't seem to have a problem with the word when you ask them about their jobs. The problem is philosophical and tightly coupled with one's definition of the HCI enterprise.

Following John Annett and Neville Stanton's (1998) definition, the line Neville and I have been taking in recent years, and which we will pursue in our new *Handbook*, is that the task concept, and the task analysis methods and their resulting models, are about: (1) the performance; of (2) systems; operating in (3) an environment; to achieve (4) work. Following the Johns Dowell and Long (e.g. Long, 1997), work is about changing the domain of application, a.k.a., crudely, the real world. In HCI, the minimal system is a direct end user and a computer system, although there may be many people and computers and many other things, both physical and abstract, in a system and in its environment. What is modelled can vary from the detailed description of the internal states of people, computers and other things, to the global socio-technic aspects, to aesthetic and moral considerations, and so forth infinitum. All this is so for any decent, broad definition of HCI.

What is special about the task perspective is its emphasis on performance: that is, what happens, what the system in its environment does to change the world. Thus tasks are about the processes of affecting the application domain and this is why I've devoted quite a few years to trying to understand what is meant by the process concept (e.g. Diaper and Kadoda, 1999) and procedural knowledge (e.g. Diaper, 1989c).

If it occurs to you that this view of task analysis is all encompassing, it is not. There are many non-performance perspectives of the universe, most obviously the static, structural, declarative types of model that describe things (Diaper, 2001c), but not, or only poorly, their interactions.

My work on knowledge elicitation, software engineering representations and processes all comes neatly together in the broad, performance orientated view of task analysis.

It doesn't matter to me what are the sources of the data for a task analysis, whether observational, interview based, ethnographic, or imagined scenarios, to choose just a few examples. Task analysis has always been supposed to be able to integrate divers types and sources of data.

What is supposed to make task analysis different from more traditional time-and-motion studies is that task analysis models both physical and psychological behaviour. I remain concerned about the quality of task analysis' psychological models. I'm not entirely happy with what is currently available from psychology and, I think more importantly, what is practical in the commercial software industries, particularly where practitioners don't have a psychology background.

If I had my way, I'd abandon the concept of goals in task analysis. My process logic works without them, our philosophical understanding of teleology is imperfect, and I've always found it very difficult to distinguish descriptions of intended states of the world, i.e. goals, from descriptions of states of the world.

Interfaces' editors gave me a 2002 word limit so I must close this article. Task analysis is at the core of most HCI work. Perhaps you call it something else. Perhaps it would be a good thing to call it something else, but changing nomenclature, it seems to me, is often associated with individual and cultural amnesia. If you think task analysis went away, then it is back with the forthcoming *Handbook* (Diaper and Stanton, 2002b). I'll take advance orders for copies any time.

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Effective teaching and training in HCI

Jonathan Crellin

The fifth edition of this highly successful series of workshops on the general theme of human–computer interaction in education will be held at the University of Portsmouth on 25–26 March 2002. This year, the workshop co-organisers are the Learning and Teaching Support Network (LTSN) based at the University of Ulster, and the Portsmouth HCI team. The workshop is also endorsed by the British HCI Group.

Our principal theme for the 2002 workshop is human–computer interaction to support the development of higher order learning skills. This is particularly relevant as more and more universities begin to adopt Virtual Learning Environments in order to offer learning opportunities mediated through on-line systems (typically the world wide web). Managed Learning Environments that integrate learning systems with administrative systems present even more interesting interface issues!

User interfaces to support content delivery, and the development of low order skills, are moderately well established. We see some variety in the surface appearance of such interfaces, but the user domain appears to be well defined, the underlying user model and the functionality required follow a standard US-centric view. For example, on-line training as offered by the likes of Cisco or Microsoft follows a learning model in which an individual learner gains knowledge from on-line resources by reading, and participating in individual activities mediated through the system itself (such as formative assessment by means of multiple choice questions). Notably absent are group-based, collaborative activities, or learning involving support by e-tutors.

The higher order skills that are often considered to be a vital part of a university education are less well catered for. Our workshop theme involves consideration of how we can develop suitable interfaces and (human) interaction protocols to facilitate the development of powers of analysis, design skills, reflective practice, evaluation, and knowledge building through collaboration. These are the kind of higher order skills that are important in higher education, and perhaps even a distinguishing characteristic of HE. How we facilitate the development of these skills when learning in an on-line environment is our main theme for the workshop.

The medium for the 2002 workshop will be sessions that lead to discussion rather than a presentation of research findings. As a participant your outline of key points will lead to open discussion. Papers are scheduled for 30 minutes with about 20 minutes for presentation and 10 minutes for questions and discussion. Your posters are presented during poster sessions that include coffee time. Some participants will offer demonstrations, giving a practical illustration of interesting techniques in HCI education. These are also offered during poster sessions. Micro-papers (5 minutes precisely) are presented among the sessions for papers, giving you the opportunity to wave a flag for what you consider to be important in HCI education, and to provoke further discussion. The workshop has always had a strong practical bias, and you may wish to present practical, classroom proven case-study material, courseworks, projects or examinations, with the intention of sharing, evaluating and further developing experiences.

In line with the main theme of the workshop your contributions may focus on interactions that are:

- individual or group
- simulation or reality
- local or distant
- fixed or mobile

Other topics relevant to HCI education are also welcomed.

We are planning a social programme that includes dinner on Monday 25 March on board HMS Warrior, Britain's first iron-clad battleship now moored in the tranquillity of the harbour. The user interface for the Warrior is particularly interesting as it was a transition ship employing both sail and steam. Participants will recognise some of the design consequences that follow such a hybrid approach!

The BCS/HCI workshop is the place where we as HCI educators learn from presentations of papers and demonstrations, and also from the community of peers gathered together. With the help of your participation we aim to disseminate good ideas, and good practice. The workshop website is *http://www.dis.port.ac.uk/~johnr/hciWS2002/*

Enquiries of an administrative nature should be addressed to Aine MacNeill, alias ltsn-ics@ulst.ac.uk. Academic or local questions should be addressed to either of the co-chairs of the workshop: John.Rosbottom@port.ac.uk, or Jonathan.Crellin@port.ac.uk.

▶▶ *continued from page 9* ▸

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Accreditation of HCI Practitioners and Usability Professionals What next?

As reported to Tom McEwan for Interfaces by Jonathan Earthy, Accreditation Officer of the British HCI Group

Up until now HCI practitioners have managed on academic qualifications and/or reputation. Suddenly we have three potential accreditation schemes. What is going on? Tom McEwan asked Jonathan Earthy (Accreditation Officer of the British HCI Group) to explain.

In the second half of 2001 Andrew Monk announced the Usability Specialists' Accreditation Scheme (USAS), a prototype, flexible, lightweight way to affirm skills in usability. The UK UPA presented an accreditation scheme based on schemes for membership of professional societies. A US initiative to set up a certification scheme for usability professionals (based on DSDM practitioner certification) was announced by members of the UPA. This rash of schemes might have been coincidence, but it is more likely to be an indication of the fairly ubiquitous take-up of (some degree of) usability in ICT, the wide range of skill and experience demonstrated by practicing usability 'experts' and the need to define what a 'usability professional' is; both to the profession itself and to managers and potential employers.

The three proposals have strengths and weaknesses:

1. The BHCIG USAS scheme is based on attestation. A candidate reads the assessment criteria and, using the BHCIG web site, asserts that they are competent in one or more areas of expertise. Sounds great for the candidate, but every year a sample of practitioners will be assessed against the criteria. For those who do not comply, ejection from the scheme will be very public. This places significant demands on the clarity of the criteria.
2. The UK UPA scheme is based on a broadly based assessment of competence against similar criteria to USAS (both schemes are derived from a scheme developed by INUSE, a European research project in the 1990s). Assessment includes an interview by one or more experienced usability professionals. This scheme obviously requires quite a lot in the way of infrastructure and administration. Professional societies cover these costs by life-long subscriptions and by the use of unpaid assessors.
3. The US scheme is likely to use a combination of submission of pre-qualification material, an essay and an interview. There will be a required core set of competencies with optional extra competencies. This scheme will undergo an extensive period of discussion and validation in workshops at international HCI conferences over the next year or so. It is expected that the scheme will be operated by a not-for-profit organisation with national licensees.

Two strong points emerge from analysis of the three schemes:

1. All schemes require the candidate to abide by a code of practice. In terms of establishing a recognised and respectable profession this is possibly more important than assessment of competence.
2. All schemes have technical competence criteria based on ISO 13407:1999 *Human-centred design processes for interactive systems*. This is a quite astonishing and very positive development. The clear message is that user centred design and its management (rather than evaluation, usability engineering or other partial conceptions of usability) are the focus of the usability community.

These schemes will give usability professionals a defined target for the development of competence. Employers and project managers will be able to recruit with less risk. Education, both academic and commercial, will be affected – not least the increasing number of short commercial courses that offer certificates of competence in usability.

In the longer term there is a need to address the issue of professional development for people who work in HCI. The British Computer Society *Industry Structure Model* and the new E-Skills *Skills Framework for the Information Age* (SFIA, http://www.e-skillsnto.org.uk/sfia /) provide a set of levels and definitions of general professional skills against which the specific skills of HCI practitioners can be categorised. The levels represent the stages of development from new recruit to senior manager (characterised in seven levels: follow, assist, apply, enable, advise, influence, inspire). Such a framework allows people to choose their own career path. Because the levels are harmonised across disciplines it is possible to gain recognition for a range of competencies that cross traditional discipline boundaries. A common framework allows employers to assess the development needs of individuals, select project staff, and design balanced, or at least comparable, levels of remuneration across professions.

The SFIA framework already contains a category entitled 'Human Factors'. This covers 'System Ergonomics' and 'Media Creation'. Whilst it is heartening to see that system ergonomics is not something to be done by inexperienced staff, it is clear that the definitions of technical competence could be improved. The developers of the SFIA have invited representatives of SIGs and professional societies that have members who work in usability (BHCIG, UK UPA, Ergonomics Society, Institute of Electrical Engineers, British Psychological Society, etc.) to assist in the development of a better set of definitions. These will, of course, be based on ISO 13407.

‘We have ways of knowing where you are’

In 1895, when one of the first motion pictures depicted a steam train heading towards the camera[1] the audience reputedly ran for cover. We might suppose that their hearts began to race, their hands became clammy and they found it hard to catch their breath. Their bodies prepared for action in the face of a threat. On reflection they may later have dismissed the idea that they were really under threat, but at the time they reacted and perhaps felt that they were present in the same place as that train. Today’s audience would be less easily fooled. Or would they?

Bigger pictures, better sound, real people doing real things. Home entertainment systems are changing. Today, there are more opportunities than ever for you to participate in a TV show and, if you did, improved broadcasting and display technologies mean that you would appear more lifelike than ever. In the future, you could be sharing a virtual game show space with your long lost Australian aunt or changing the course of events in your favourite soap. The choice will be yours, to opt for an enhanced two-way relationship with your household media systems.

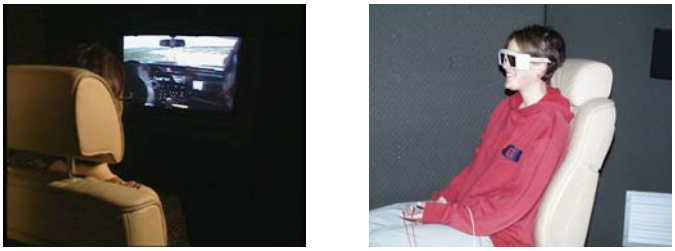
The introduction of digital television into our homes, combined with the current convergence of media and communication technologies, will afford the possibility of more frequent and better quality experiences of ‘presence’. Presence has been defined as the subjective sensation of ‘being there’ in a mediated environment[2] (such as immersive television or virtual reality). In addition to a sense of being in a physical location, new media may also better afford the sense of being with someone and having a meaningful interaction with that someone (be that your Australian aunt or your television itself).

i2 media research[3] at Goldsmiths College, University of London, promotes the concept of presence as an important consideration in the design and evaluation of new media systems. While designing for high-presence may be desirable for some applications (such as on-line therapies) it may be undesirable or unnecessary for others (such as paying an overdue phone bill).

By considering presence in terms of media form, media content and user characteristics, researchers can recommend what medium works best for whom and when. These recommendations require reliable and valid ways of measuring presence. The i2 media research team has developed, and now utilises, several types of evaluation to tap what it is to be somewhere and with someone.

These techniques tackle whether a user reports feelings of presence[4], whether they overtly behave as if they are present[5] and whether they show the physiological indications of being present in a mediated environment. The latter approach forms the basis of my own PhD work. I want to know if certain physiological signals can be used as reliable indicators of presence and if these relate to a person’s emotional experience of a mediated environment.

But why use a complicated physiological measure if you can simply ask people to rate their sense of presence? For several reasons, physiological measures add a new dimension to the study of presence: (i) they are objective and less prone to biases than subjective measures, (ii) they can be used during mediated experiences without interrupting the experience itself, and (iii) they can also reveal covert reactions to stimuli. Because some physiological reactions are not normally under conscious control, people’s immediate and unconsidered impulses can be observed through these means. What people say and how they react non-verbally don’t always match up. This is an important feature of physiological measures, both for presence research and for HCI disciplines in general.



Participants taking part in physiological experiments in the Platform for Immersive Television at Goldsmiths College.

Physiological data can be collected from almost any bodily system: the nervous system, digestive system, muscles or eyes for example. I have been particularly interested in activation of the autonomic nervous system, which reflects fight-or-flight responses plus rest-and-digest regulation. When a train hurtles towards you in a virtual environment, with 3D visuals and spatialised-sound, your fight-or-flight response system may be more likely to be activated, more intensely, than if you saw the same scene on a 16-inch black and white television monitor. Similarly, if you had the chance to vote with the audience of ‘Who Wants to be a Millionaire’, rather than just watch them, your increased vested interest, engagement and excitement might display itself physiologically.

In order to assess the utility of these autonomic measures of arousal (such as Skin Conductance and Heart Rate) I have examined whether they distinguish between different levels of presence. To create different levels of presence aspects of media form and content have been experimentally manipulated. Stereoscopic and monoscopic video footage have been compared, as have different screen sizes and screen surrounds. Emotive and non-emotive video footage have been used as stimuli.

Research in this area is in its early stages. My results suggest that autonomic measures are a potentially important additional source of information about a user’s mediated experience. Subjective presence measures and physiological measures are sensitive to manipulations of the determinants of presence, but in different ways. Whether or not the autonomic measures offer utility as indicators of presence will be revealed through further investigation. A consideration of the user’s physiological characteristics will help answer this question, as will an exploration of several types of analysis (e.g. the examination of levels of arousal vs. event related responses).

Meanwhile, these versatile physiological measures are being harnessed in a variety of ways in a range of immersive applications[6]: as metrics of virtual therapy effectiveness, as biofeedback tools and as communication channels between distributed users and between user and medium. The ability to read our own physiological signals while also being able to

Cath Dillon

project these signals to remote locations, machines and people has implications beyond presence measurement. Accessibility could be improved, emotive mediated communication could be enriched – new forms of presence may be achieved.

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Kamaljit Nagpal and Xristine Faulkner, both of South Bank University, will present their pilot study of e-mail use in next issue's Learning and Doing article.

My PhD

Kit Logan

> "You sit in your office all day working on the internet when the rest of us slog it out all week and all weekend in labs running samples."

Doing a PhD in computing, I've discovered, can be rather unappreciated. Not least by those who work with the purer sciences, as evidenced by the recent, slightly-edited-for-language and certainly misinformed quote above from an irritated housemate. I understand their exasperation over lab equipment inconveniently breaking down. I only have to put up with software failures, incompatibility, 'features' and the occasional total rebuild of a computer system. They work odd hours to catch up, while I work odd hours because I find my PhD topic fascinating and I frequently forget what the time is.

First off I have to confess I can often feel out of my depth as a psychologist in a computing department. Not having a computing background I still have to reach for the bookshelf to understand even some of the more commonplace computing concepts and vocabulary. But then many computer scientists often confess they feel just as much out of their depth with psychology, which perhaps explains why the area of human–computer interaction, where psychology is important, is so fascinating.

My PhD's short title is 'Observational Studies of Distance Education Students'. Based at the Open University, I work with AESOP (An Electronic Student Observatory Project) – see ***www.open.ac.uk/aesop/***. AESOP provides a collection of software applications for recording, replaying and automatically analysing recorded data, and allows detailed, remote observation of subjects who are using on-line teaching material. The AESOP set-up is like having a video tape of what is going on without the obtrusive presence of an actual video camera or observer. Students download and install the recording software onto their machines, then work normally as and when they desire, with additional information being obtained using online questionnaires.

The research questions have evolved from observations and patterns noted in online behaviour. A specific interest is whether it is possible to observe any factors that cause students to make errors and what can be done to help them learn. Two studies have already been carried out and published, both looking at time as a factor.

In one study, we found that people using 640x480 resolution screens took significantly longer to complete exercises than everybody else. This was not due to the processing speed, but to the extra time taken to swap between windows because they couldn't view the instruction and workspace windows side by side.

In the other study we looked at the time when students preferred to work. Students were seen to work around the clock with lunch time and evening peaks at around midday and 8pm; the time of day when they preferred to work was not found to be influential.

However, we did find three distinct sets of time-related working practices. One group of students completed a set of exercises in one go, a second group completed the exercises over a couple of days, and a third group would start, do a bit, then leave it for up to several weeks. Although not significant in themselves, these working patterns taken together with other observed patterns in how students deal with errors was strongly suggestive of learning style differences. So we are now using online questionnaires to identify students' learning style preferences. The implication is that it might be possible to automatically detect an individual's learning style preferences from their online behaviour. We aim to explore this further and investigate the potential of developing software that adapts automatically to an individual's learning style.

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Syndicating your content on the Web

The Web has come a long way. What started as a world of static, interlinked pages, where the browsing experience consisted of firing up Mosaic and touring the monolithic, scrollbar-hungry pieces of text, clumsily converted from paper-based media, has now become a universal, generic framework for communicating on-line. (Phew... all in one breath too!)

The Web is more active than ever, providing a whole new experience for the user. Chat forums, discussion lists, personalisation, on-line services (shopping, banking, insurance…), web casting, along with other numerous applications and database-driven services, are now commonplace. Each pushes both the technology and user interface professionals to their limits. The Internet is moving towards providing web services, not just through the browser, but also for applications to communicate directly with each other, sharing and re-using information that they supply.

Upload top ranking!

A side effect of all this expansion and complexity is, of course, the no easy feat of attracting visitors to your site in the first place (and holding onto them, assuming your content is worthy of a return visit). Competition is fierce and gone are the days of simply registering your domain name, uploading a few HTML pages and then registering the URL with a selection of search engines. The ability to attract 'hits' has become an art in itself, with various techniques now being adopted.

The obvious tricks-of-the-trade to ensure that your pages are well optimised for high search engine rankings (good meta-tag use, appropriate page titles and text, for example), will now only (at best) put you on a par with many other sites. Search engine fees, and how often external sites link to your site, are just two of the many factors that will influence why your pages are 'still not' ranking high in search results.

Supplementary approaches are needed. Mail shots and newsletter subscription services, for example, work well and have an excellent ability to regularly 'pull back' those users who may have forgotten just how good your site is!

Let's all share!

What would be nice, though, is an approach that allows sharing of your content with others, whilst still encouraging linking (and thus visits) to your site, and that does not cost the earth to set up. The key is to provide enough information to be useful to others, but not so much as to make your website 'redundant'.

One area that has received a great deal of interest is that of syndication – information being supplied for re-use and integration with other content. News is probably the most popular of domains here, with newspapers and magazines receiving content (news feeds) from information providers such as Reuters, to then format as they wish, and merge with their existing content. These services are, of course, normally by subscription, with various filtering and customisation facilities being available.

The web is an ideal medium for providing such services, with electronic data exchange and increasingly standardised metadata – more about this in the next issue. Clearly, if we have some content to share, on-line syndication is something we should consider. The next section illustrates how easily this can be achieved, using news headlines as an example. Note that news is simply an example – the approach can easily be adapted for other content such as 'HCI tip of the day', 'usability book of the month', 'most contentious web design remark this week'! The list goes on …

This is a very powerful way of automatically getting other websites to pull in your content as and when needed, whilst rather cleverly promoting your site. And next issue we will rather cleverly promote the world's best usability site, by demonstrating how your site can have its very own usabilitynews.com feed.

The technical bit

There are various ways of providing a news feed web service. For those 'into' server-side programming and development, we could for example, web-enable some methods of a news provider object on our web server, adopting a suitable protocol for transmitting XML 'over the wire', such as SOAP (Simple Object Access Protocol), which then any consumer of that protocol could make use of. The SOAP approach is nice in that it uses standard HTTP (usually port 80) as the mechanism for transport and thus works well over firewalls, where specific port numbers are often blocked for security reasons.

If we are simply trying to integrate news headlines in our web pages from another website (as in this case), probably the most straightforward approach is to use the client's browser to do the integration for us, by using JavaScript embedded in the web page to 'include' remote content as needed. The only caveat is that scripting needs to be supported (and enabled) in the browser. As most users have browsers with this facility switched on (and lets face it, if they didn't the majority of sites would not work) this is not something we should be too concerned about, but nevertheless needs considering, depending on your target audience.

Thus, we need to do two things:

1. Provide a feed from your site
2. Provide the necessary script for users of the feed to embed in their remote page to consume it.

Providing the service

First decide on what content you wish to provide and in what format. In Figure 1, for example, we'll simply provide a

```
<a href="http://www.yoursite.com/newsitem1.html">First headline here</a><br>
A summary would be here...<P>
<a href="http://www.yoursite.com/newsitem2.html">Second headline here</a><br>
A summary would be here...<P>
etc
```

Figure 1

```
document.write('<a href="http://www.yoursite.com/newsitem1.html">First headline
here</a><br>');
document.write('A summary would be here...<P>');
document.write('<a href="http://www.yoursite.com/newsitem2.html">Second headline
here</a><br>');
document.writeln('Dave\'s second news summary would be here...<P>');
```

Figure 2

headline and summary in HTML format, where the headline will be an absolute link to our site (remember this content will display embedded in someone else's web page).

Remember to use absolute URLs and avoid any special formatting, such as colours or fonts, as this content will be presented in the remote page's style. (In fact this is a drawback of using HTML as the format for transport, as inevitably some presentation will be carried by its very nature – next issue we will look again at this topic.)

Once decided, you then need to wrap the content in JavaScript, as in Figure 2, because it is the script that is included in the remote page. This then runs and writes the content to the user's browser at the relevant place in the page.

We've simply wrapped the HTML up in JavaScript *document.write* statements, which will be parsed and run down in the browser in the remote page. This is a very simple approach for generating content in the browser, but works well. Remember to use absolute URLs as links, and to use escape sequences for special characters in your text if need be (for example, note the \' above to indicate an apostrophe in the second news summary). Watch out for carriage returns also.

Once done, save the file as a JavaScript .js include file (e.g. news.js) and upload to your website as usual.

Script for the remote page to use

Now you simply need to provide the necessary code to embed in the user's remote page. Assuming you uploaded the .js file to the root of your website, it would look like Figure 3.

Typically the user would also add some formatting tags around the script, such as fonts or colours, but that is for the user to decide, not us. Notice also the <noscript> tag, acting as a catch-all for those non-JS enabled browsers.

Once your script is embedded in the user's page, your headlines will be 'magically pulled in' when the page is downloaded.

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```
<script language="JavaScript" src="http://www.yoursite.com/news.js">
</script>
<noscript>
Sorry, you need a JavaScript capable browser to get news headlines on this page</noscript>
```

Figure 3

Continued in Issue 51, when I will examine metadata standards and updating content, and illustrate the code for a specific, working example. But those of you who are impatient can check out: *http://www.usabilitynews.com/help/newsfeed/* and see it in action at *http://www.visualize.uk.com*.

Book reviews

Xristine Faulkner

Myth of the Paperless Office
Abigail Sellen & Richard Harper
MIT Press, 2001; pp 231
£16.95 cloth
ISBN 0-262-19464-3

Now, here's a book that's worth the trees it felled and one that should dispel any grand thoughts of an instant fix to the proliferation of paper that clutters up your office. Sellen and Harper have scrupulously examined their subject and have plenty of data to support their reasoning. And after reading what they have to say you may well decide to consider buying shares in the paper industry if you have any spare cash over from Christmas and no political objections to gambling on the stock exchange.

The book is based on careful research and a very careful study of the various aspects of paper and its use. It is well illustrated with photographs, tables and graphs, and examples. I loved this book. I was impressed by the scholarly approach to the subject, the careful research and the unfussy simplicity of the writing style. It is not only well researched but it's well written, entertaining, lively and has a gentle, unassuming sense of humour which leaves you knowing it was written by humans with humanity in them.

Don't look at the title and say, 'this isn't HCI!' – because it is. The observations on reading alone are a must for the HCI community. It may just alter the way we think about tools, how we design them and how we set up our investigations into office behaviour. The thrust of the argument is that, just now, people aren't going to abandon paper because it is too useful and, in fact, the amount of paper that people use reflects their tasks and their productivity. There is something about paper and its affordance that electronic devices aren't doing for us just yet.

I've always preferred to write things down though several attempts have been made to wean me to palm-held devices and it was nice for me to have my prejudices pampered to by this scholarly book.

This is one for your bookshelf and one for the library. Lecturers: make your post-grad students read it and see if some of the under-grads will tackle bits of it too. It's a gem… worth every scrap of paper used in its production.

Usability for the Web
Tom Brinck, Darren Gergle & Scott Wood
Morgan Kaufmann, October 2001; pp 481
ISBN 1-55860658-0
$49.95

Here's yet another book on usability and the Web, but this one has a few things about it that make it worthy of examination. For a start, it is a very practical book that expects the reader to be someone who wants to get web usability right and to be involved in the process of making that happen. Secondly, it is by an interesting collection of people who have insights into usability that are worth looking at. Thirdly, it's an incredibly good read. It rattles along at a good rate, is packed full of good advice and I had the distinct impression that here was real web usability.

I am delighted with this book. It does all of the practical side of web development that Nielsen doesn't address in his excellent book on web usability. The authors are quite clearly writing for people who really want to know how to build usable sites. It deals with all the areas and problems that site-builders must address. The authors are an interesting mixture, with diverse experiences. They obviously enjoy getting things built and this enthusiasm comes over in the writing; it permeates the pages. The style is appealing. It is no nonsense, effective and friendly without being over-familiar – textbook writing at its best. Here are pictures, diagrams and colour but the publishers have been very clever and kept these small and discreet. So the price is still a good one and affordable for students, who may well want to read this. The overall effect is of a book that is well and amply illustrated without being lush or appearing like a picture book.

The authors take the reader through the whole process of designing, building, testing and evaluating websites. They deal with representing design, design guidelines, presenting the designs so that people can examine them, the process of managing a project. Best of all, all of the good design rules are offered and explained rapidly and simply. The book is crammed full of good advice that quite clearly stems from experience. The examples and illustrations are excellent and the authors are at great pains to leave no problems unsolved.

The book describes itself as being designed for practitioners and anyone who wants to learn so I guess that would include students and certainly it would be useful for them. I know it isn't designed as an academic text but, as so often, the referencing, and its presentation, irritate me. I really wish that writers would include these after each chapter and then as an alphabetical list at the end. I get really fed up with flicking through to the end to see what's being referred to and I never know which chapter I'm on. The complete list at the end is always useful.

But it's not a perfect world. So, this one, again, for your shelf definitely, one for the library, and perhaps you can get students to read it too. It will bring together under one roof many of the areas of their courses that they are studying – and the good thing is that the roof is a usability engineering roof.

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The ultimate interface and the sums of life?

Alan Dix

'dust you are, to dust you shall return' Genesis 3:19

I was talking recently to a colleague, John Hutchinson, who is thinking about ways to augment our memories and assist us in linking this to external knowledge. There have already been a number of research projects in this sort of area (e.g. automatic diaries based in active badges at Xerox in Cambridge, MIT cyborgs) and there are potential practical benefits.

This led me to wonder just how much memory it would take if we really did try to remember everything in our lives. Now I recall, from articles many years ago, that human long-term memory is only laid down at about half a bit per second, but we are very good (and sometimes bad) at selectively remembering things that are significant. A computer assistant would be able to remember more than this, but would be far less selective; let's say it remembers everything we see or hear.

With good compression it is possible to get pretty high quality video and audio within ISDN capacity, so let's say 100 kbits/second will be needed. At a biblical life span of three score and ten, our lives are a mere two billion seconds. So our complete life experiences amount to 200 terabits, or about 400 hard disk drives.

In fact, we have seen a constant reduction in cost and size of memory over past years. I'm not sure of the exact figures, but let's take a Moore's law figure of doubling every 18 months. At this rate, the real crunch time, in terms of worst memory requirements, is about 2 years in (see box). After this point the increases in storage capacity would mean that the accumulated memories would take less and less memory each successive year.

after T years:
storage size, $S = aT\ 2^{-T/b}$
where
a = data/year = 300 billion bytes
b = halving time = 1.5 years

differentiate to find maximum:
$\frac{dS}{dT} = a\ (1 - T \log_e 2/b)\ 2^{-T/b}$
So worst size at $T = b/\log_e 2 \approx 2$ years

After two years we would have accumulated around 60 million seconds of data, that is around 6 terabits. If we started such a system now (and assuming the increase in storage capacity) this would require about half a dozen hard disks over the coming 2 years, but we could discard these for smaller, cheaper, larger, faster disks over future years. At first we would need to use wireless technology and remote storage, but, as storage devices shrink, we would be able to carry our lifetime memory with us. Each year they would shrink.

If trends continue, in 70 years storage capacity will have doubled around 47 times – that is capacities will increase 100 trillion-fold. At this rate 200 terabits will only take the space of 2 bits today! There are quantum limits to information density, so let's take this into account. Let's assume we need 1000 atoms of silicon to store a single bit without quantum problems (pretty conservative). Two hundred terabits would require a device containing 2x1017 atoms of silicon. This is about 10 micrograms or a sphere less than 200 microns in diameter.

So, if we did this for a baby born tomorrow, when the baby dies in 2072 the storage device needed for a whole life's experience would be the size of a small grain of dust.

There are a number of research projects and devices aimed at this form of lifelong memory; for links to these and related material see:

http://www.hcibook.com/alan/papers/dust2002/

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Making UML the Lingua Franca of usable system design

Chris Rourke

Successful and usable system interfaces are built out of the co-operation of two disciplines: software engineering and human–computer interaction (HCI). Both disciplines have concepts, techniques, and notations for specifying, constructing, and evaluating their respective editing objects, but they are based on two different views of user interfaces. The user-oriented view focuses on the user's tasks and the required interactions with the system to fulfil these, while the system-oriented view defines how the software is to be implemented. Although design activities for these often occur in parallel, there are two different design spaces, and different design communities, which inevitably join each other in the user interface.

It has been widely recognised that the two disciplines should interact frequently to create a more usable user interface design. The adoption of Object Oriented development methods has been a great catalyst since these enable a move away from the rigid 'waterfall' design process, toward an iterative approach which can integrate information about users, their context, and preferred task methods up-front in the system life cycle. Incorporating such user-defined information enabled archaic batch system designs and other commercial applications to better suit their end-users. This was an encouraging sign. Although the two camps did not yet speak the same language, objects, actions, classes, and interaction diagrams were recognisable terms to the HCI community.

Within the Object Oriented process, UML (Unified Modelling Language) has become the *de facto* standard and is seen by many as the best opportunity to link the two areas. It reflects several HCI task modelling concepts, and gaps that exist between software engineering and HCI representations might even be bridged by alterations to the original UML. (At this stage it is worth noting that UML is a language and not a tool or a method, but since its usage is usually through tools such as Rational Rose as part of a systems development methodology, the rest of this article avoids being overly pedantic!)

So is UML a 'Trojan horse' by which we may infiltrate user-centred design principles into traditional software designers? That was a central question at the Usability and UML symposium in Edinburgh, sponsored by the British HCI Group and the ScotlandIS Usability Forum. Several leading academics and practitioners shared their views and experience to let the attendees at this sold-out event decide for themselves.

The 12 speakers covered a range of topics, beginning with a top-level introduction to UML concepts and diagrams, by Birgit Bomsdorf (FernUniversität Hagen) and Gerd Szwillus (University of Paderborn). Adding further foreign spice, Phillippe Palanque came all the way from the University of Toulouse to deliver a fast-paced tour de force presentation on applying Interactive Systems Engineering in the development of an air traffic control system interface.

Dave Roberts next gave an insight into how IBM adapts UML to achieve a more user-centred system throughout the '4 D's' (discovery, design, development and deployment), and especially facilitates communication within the design team and to the client company.

After summarising how UML can enable a synthesis between two previously distinct disciplines, Mark Van Harmelen moderated a discussion on what needs to be done technically and by the community to ensure success of UML as a 'Trojan horse'. Dave Martin, Mark Rouncefield (Lancaster University) and Rob Proctor (Edinburgh University) then discussed how ethnographers can deliver patterns as a useful description of user behaviour in a notation that is amenable to system designers.

Perdita Stevens (Edinburgh University) predicted benefits from future UML tools that will better support user-centred design for everyday programs and systems. She emphasised that tomorrow's UML tools must be flexible enough to support the different types of users of UML, from those that collaboratively 'do' a design at a whiteboard to those that record and refine a design at a computer screen. Peter Johnson of the University of Bath vividly applied UML to model the social and technical interactions that resulted in a plane accident, and finally Lachlan Mackinnon (Heriot Watt University) focused on potential extensions to UML notation and usage to make it the 'Babel fish' of system design.

Throughout the day it was generally recognised that UML diagrams are different from HCI task models, most significantly because there is no specific modelling of user goals and intentions in UML. However, there were opposing views on whether or not UML should be adapted to better represent HCI notations or individual development projects. Philippe Palanque and others felt that such mutations would reduce the ability of UML to serve primarily as software development notation. Others pointed out that better synthesis between HCI and software engineering could only be achieved by modifications such as: (1) extending the basic UML notations, (2) modifying existing notations, or (3) somehow linking the UML diagrams to separate external task models.

The symposium showed that, as a way of relating the two design spaces of HCI and software engineering, UML is currently the best way of applying Object Oriented methods. Innovation and natural evolution of UML will certainly occur, and, as often stated in such symposia, more research and case studies from practice will benefit everyone. The session ended on the encouraging note that it seemed inevitable that HCI and software engineering will move towards and learn from each other. Chair Tom McEwan (Napier University) highlighted that the equal mix at this event of researchers and practitioners, software engineers and HCI specialists, was an opportunity for all present to integrate their efforts better than was currently done.

Tom thanked organisers Alistair Kilgour (of BHCIG), Polly Purvis (ScotlandIS) and Judith Ramsay (ScotlandIS Usability Forum), and Ian Smith and Sun Hea Choi for technical support. The Symposium web-site at http://www.dcs.napier.ac.uk/~mm/uu2002/ contains the slides and abstracts for each presentation.

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TiVo: Now you see it, now you don't

Nico Macdonald

The video cassette recorder has rightly been the example du jour of poor interface design and usability in consumer electronics. Critics such as Harold Thimbleby have regularly cited VCRs in evidence, knowing that most people have suffered while fighting with them. According to now apocryphal research, only 25% of owners program their VCR to record future shows, but the VCR earns its keep in the family home with its real-time recording capability and ability to play rental videos.

'Programming' is the appropriate verb to use when considering the VCR. It is the most complex device (other than a personal computer) typically found in the British home. Yet its user interface and remote control have always been an afterthought, combining a cheap display with controls determined by manufacturing constraints, and interaction shaped from an engineering perspective. More advanced VCRs use the television display for the visual elements of the interface but this has rarely exceeded the quality of experience of Windows 3.1.

Enter the new contender

In the last few years a new breed of device, the personal video recorder, has appeared on the market in the guise of SonicBlue's ReplayTV, TiVo, and Microsoft's UltimateTV (though as we go to press the latter looks likely to be abandoned). At heart these devices are a box with a large hard disk, computer intelligence, and a network connection. TiVo is the only PVR available in the UK, in the form of Thomson's Scenium, a silver box the size of a large-ish VCR with just two lights on the front showing the device's status and whether it is recording.

TiVo sells itself on its ability to pause live TV (by buffering a show to disk), its ease of use, and its ability to record shows based on a user's implicit preferences (what else they have chosen to record), and their explicit preferences (what shows they have given a 'thumbs up' to).

TiVo hails from Silicon Valley, not South East Asia nor the Netherlands, and user interface culture has thoroughly informed its design. Like modern VCRs it uses the television to display its interface, and it has a remote control that is a distinct pleasure to use. Created by renowned designers IDEO, the remote control has tactile buttons that vary in size and action, is presented using carefully chosen colours, and sports well-considered icons. Its shape and weight were determined by what is comfortable to hold, not what is easy to mould.

Interface

The TiVo graphical user interface doesn't have to support the wide range of functions demanded of a personal computer GUI and as a result is able to present a more satisfying experience. Screens slide gracefully from left to right; after selecting 'Back' the menu option that indicates that no action is to be taken is briefly highlighted, and selections made on previous screens remain selected.

Audio is also used well to indicate successful selection, or an action that can't be performed. Unlike personal computers where audio is often a distraction (to colleagues if not to the user) the TiVo sits in a sound-friendly environment and audio can be an integral part of the interface.

On the aesthetic side, colour is used to create a feeling of solidity but also of relaxation. A sky-like pattern forms the background to the screens and a small TiVo icon dances in the top left corner, giving the device a distinct personality.

Of course the most gratifying aspect of the user interface is the ability to select by name programmes to view or record (or delete) using the kind of electronic programming guide with which viewers of Sky and other enhanced TV services will be familiar. The TiVo's information design and typography are an improvement on most EPGs. An elegant progress bar shows the length of a show and the elapsed time, and, when you fast forward, which of the three speeds it is moving at. Recognising the time lag between seeing where you want to be and pressing the play button, the TiVo steps back a given period when you stop fast forwarding.

User support

Wonderful as the user interface is, a complex product also needs good customer support, and TiVo delivers this in partnership with Sky. Customer support staff actually know how the product works and can request that information patches be sent to your device.

There are some major user interface challenges that TiVo has not yet addressed. One such challenge is how to give users a sense of the way their implicit and explicit preferences are used in choosing what is automatically recorded, and how they might directly manipulate these preferences. Another is how multiple users with different preferences can be accommodated.

Criticisms and thoughts

My major criticisms of TiVo relate to its set-up procedure. The set-up interface is consistent with, and up to the standard of, the other elements of the product; however, the complexity of the process and the number of steps required (from indicating how you receive a TV signal to what provider you use and the RF number for each station) demands that the interface be even more robust. It took me a week to get the box working (admittedly with some of that time elapsing while waiting for information patches), and a

▸ *continued* ▶▶

Computers and Fun 4

Mark Blythe, Darren Reed & Andrew Monk

A British HCI Group one-day meeting held on Thursday 29th of November 2001 The Huntington Room, King's Manor University of York

The Computers and Fun meeting of 2001 generated a great deal of interest and the reviewers suffered from an embarrassment of riches. The first paper of the morning was given by Erik Blankinship from the MIT media laboratory and he demonstrated his talkTV prototype system, which allows users to take clips from TV programmes and use them as quotations in emails. Antonella De Angeli talked about the possibility of verbal humour in the chatterbots which are increasingly common and sometimes mistaken for people in chat rooms. Marcelle Stienstra told us about three weird and wonderful devices she had designed to give children fun experiences. The final talk of the morning was from Mitja Kostomaj who told us about the design principles behind the CDROM he had developed around the children's character Cat Muri.

During lunch we divided into groups and played parlour games in order to think about what makes them fun (or not) and how we might transfer these kinds of activity to computer-based formats. The only casualty was Alan Dix's beard which was pulled as a forfeit during one game.

Despite the beard molestation Alan began the afternoon session with an enthusiastic and arresting presentation on his virtual crackers software. Next, John McCarthy delivered a fascinating paper on his personal experiences of enchantment with technology, in particular the gorgeous and much coveted Apple G4 Powerbook. Janet Read told us about some of the problems of measuring fun in children's activities. Finally Christina Chen described an interactive storytelling system based on a new mobile media platform. The range of brilliant ideas generated in the closing discussion of the parlour games and the possible computer-based adaptations that we thought of must remain closely guarded commercial secrets.

Abstracts

Whose Line Is It Anyway?

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People refer to television and movies in the flow of their everyday conversations, citing dialogue as part of their talk. Television and movies are part of popular culture; they help to make shared references between people. We aim to take this behaviour to the next level. We want people to have access to the source materials they are quoting and to use these snippets to enhance online communication.

Our prototype system, talkTV, allows for this to happen. Simply explained, talkTV allows viewers to search through digitized broadcasts for quotes and to extract them. Type in 'how are you' and talkTV retrieves all of the scenes where the phrase is spoken from a video library: maybe one clip from 'Friends', another from 'EastEnders', another from 'Absolutely Fabulous'. The system searches the Closed Captioned subtitles embedded in many broadcasts. The Closed Captions' primary purpose is to provide the dialogue of the programme on screen for deaf viewers so they can 'read' television. We use the Closed Captions as a script that can be searched for quotes.

Once good quotes are found, they are ready to be slipped into conversation. talkTV works with e-mail applications and chat programs like AOL Instant Messenger so users can converse using video clips to speak for them. For example, a Teletubby can say 'Hello' for you, and your friend can respond with Captain Picard of Star Trek.

Viewers can also sequence clips together into scenes. Bart Simpson can ask, 'Who ate my shorts?' and Martha Stewart can answer, 'Oh, that was me.' If characters say it on television, viewers can place it out of context. The opportunities for unintended innuendo are enormous.

Will people do this? In some ways, they already do. Fans of certain shows, such as the Trekkies who watch Star Trek, record programmes and then re-edit them to create music videos or original scenes (Jenkins, 1992). By splicing a bit of one scene with the end of another scene, new dramatic situations are created.

We propose that with a simple enough tool, this creative activity will appeal to casual viewers of soap operas, comedies, and even the evening news. talkTV enables people to play with their television shows and to have fun in the process.

Jenkins, Henry. *Textual poachers: television fans & participatory culture*. New York: Routledge, 1992.

▶▶ *continued from page 18* ▸

typical family wanting to get the new gizmo working on a Saturday afternoon will have their patience severely tested by this process.

Conclusion

While it is fascinating to see a computer-derived GUI running on a task-driven consumer device, this may not be the best or most appropriate way for 'real' people to interact with complex consumer devices. But for now it is a great step forward and may ameliorate the typical customer's experience of badly thought out, incompatible and inconsiderately designed home electronics.

For references from this piece please see:
http://www.spy.co.uk/Articles/Interfaces/TiVo/
See also http://www.tivo.com/

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Is verbal humour possible for chatterbots?

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What do people do for fun on the Internet? Well, most of them chat: they talk in a friendly and informal way with other people. On-line communities, chat rooms and instant messaging systems have been the topic of much research and have grabbed enormous public attention so far. Our research concentrates on understanding what happens when people chat with machines instead of with people. The question is: 'Does the dimension of fun, enjoyment and humour which accompanies interpersonal chatting survive the fundamental limitations of a conversation with a machine?'

The target of our research is chatterbots, computer programs that simulate a conversation with the user. The complexity of their algorithms varies but, in general, all of them are programmed to respond to linguistic inputs with canned pre-scripted statements. In this way, they can have a somewhat logical conversation, even without being capable of real understanding. Rather, they are all about the illusion of intelligence and the suspension of disbelief on the part of the user. Following the principle of the 'imitation game', they attempt to fool humans (at least temporarily) into thinking they are talking to another person.

Recent years have witnessed an extraordinary explosion of interest in chatterbots. The basis for such success is the belief that they render computers more engaging, fun, and entertaining, so inviting recurrent use. To test this assumption we have asked 60 users to chat with Alice, (Artificial Linguistic Internet Computer Entity), a proud 'robot' that exhibits human-like feelings and intentions while chatting with the user. 'She' asks and answers questions, reminds people of appointments, tells jokes, spreads gossip and even lies. The analysis of the linguistic corpus and of the people's subjective reactions has provided some insights into the social interaction with machines.

Here, our interest concerns the production and perception of humour in human–chatterbot conversation. Humour is a ubiquitous and complex phenomenon, which occurs mainly in the presence of incongruity. Verbal humour is often intentional and emerges from the violation of the co-operative principle and of the conversational maxims. Therefore, humour requires conversational intelligence, a dimension which is lacking in current chatterbots. This generates a number of questions. Is 'artificial' humour possible? Would it be perceived as intentional? Where is the borderline between the perception of humour and the perception of stupidity? Our paper will deal with these issues, integrating communication theory, research on humour and actual examples of human–chatterbot interaction extracted from the corpus of our study.

Tangible interaction tools as a means to create a fun experience.

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Children growing up with today's technologies are presented with electronic toys that offer them mental rather than physical stimulation. As it is important for children that their development takes place at multiple levels, we wanted to investigate the possibility of developing an electronic toy for children that is both fun to use (and thus motivating) while it also stimulates (skill development) learning.

According to Csikszentmihalyi, a person experiences an 'optimal experience' – feels best – when he voluntarily puts effort into the accomplishment of something that provides an optimal level of challenge to this person [1]. The activity should provide a balance between the skills necessary to accomplish the activity and the difficulty of the task itself. Not only does the achievement of a certain goal provide an optimal experience, but the activity leading to this goal can be rewarding in itself. These activities may include mental and physical activities.

Within the field of educational psychology it is recognised that pleasure is an important element in system and software design: while children also use computers to complete tasks, the real motivation that children have to interact with technology is *enjoyment* [3]. Elements that make (educational) software enjoyable, as postulated by Malone and Lepper [5], are, for example, the presence of an appropriate challenge to the user such as an uncertain outcome, elements that raise the user's curiosity like randomness, and fantasy elements in the interface.

While Malone and Lepper focus on software design, we have tried to apply their heuristics in the design of enjoyable input devices that enable interaction with electronic content. The context for the design is the development of an interactive television application for children aged 8 to 12 years. To accomplish the interaction with the broadcast content we provide the children with tangible interaction devices that invite them to take an active attitude, mentally as well as physically. The children are mentally challenged by the fact that they have to co-operate in order to accomplish tasks. Also the way the devices can be used is not obvious: through exploration the children can find out how and what can be accomplished. For appropriate physical challenges research on child development and gender differences (for instance [2], [6]) indicates that there are significant differences in the motor capabilities of boys and girls aged 8 to 12 years: boys' gross motor skills are better developed than those of girls, while the fine motor skills of girls are better developed than those of boys. This knowledge forms the basis of three different tangible interaction tools: one tool that appeals to the gross motor skills of children, one tool that appeals to the fine motor skills of children and one that appeals to both gross and fine motor skills. All three interaction tools depend on the co-operative interaction mode and explorative attitude of children.

In an experiment that is about to be conducted, we want to investigate the experiences that children have while playing with all three tools. Through a 'fun' rating scale that is developed at Philips Research [4], a paired comparison test and observations during play, we want to find out whether these tools are indeed fun to use, and if so which one is the most fun.

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Is a lot of interactivity necessarily a lot of fun? What makes an Interactive Story System fun for children?

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Through the experience of working on the commercial project **Cat Muri on the CeDeRom** this paper tries to answer the question: is a lot of interactivity in the Interactive Story System (ISS) necessarily a lot of fun? (Here, interactivity means structure – the number of options.) This question inevitably brings new ones; what kind of narrative is appropriate for this age group and how can this be translated in the ISS? The issues of character development and the roles of illustrations, animations, sound, links, icons and other interactive multimedia elements in the whole process are also considered.

Cat Muri on the CeDeRom is an ISS with a linear main story. It has 22 pages, 16 games and activities published on a CD-ROM in the Slovene language. The application is targeted for children aged between 5 and 8. ISS Cat Muri uses a metaphor taken from classical books and adapted for interactive multimedia environments. Objects on the page in ISS can come alive and children can explore the interactive world, play games, solve puzzles. The main goal was to design something fun for children to use with a joy and excitement that would enhance creativity and imagination. Subgoals covered usability, story and character development, activities and learning.

Constraints of the interactive world for children

The Need for a Happy Ending

ISS uses a structure known as 'String of Pearls' where different pages or scenes are linked with plot points. Children can move forwards and backwards as easily as browsing a classical book. The narratives that children love have happy endings. By having multiple paths in a story, the end might not be in line with childrens' expectations.

The Danger of Cognitive Overload

Often in interactive worlds, the user doesn't know where s/he is going or where s/he's been. Cognitive overload is an even more important issue with children. According to Plowman (1998), hypermedia structures can lead to children losing track, not only of the structure, but also of their own thinking.

The Importance of a Creative Journey

According to Kordigel (1997), encounters with children's literature in the pre-school period should be spontaneous and directed towards a creative voyage through literary worlds, but at the same time stimulate the child's receptive ability and help him or her experience a literary work in all its aesthetic and emotional intensity.

The paper examines the main features of ISS and explores what makes ISS fun for children with regard to the following elements: Story, Characters, Scenes, Props, Pace and tempo, Activity on the scene, Links and hot spots, Sound, and Visual design and animations.

No great comedy or children's story is fun all the time. The great comedies are sometimes serious and then the situation creates funny moments. *Stories* are fun if there is a situation that lets characters act and react to the situation and each other. The *Characters* in stories for children are mostly black and white, but this doesn't mean that the characters are not unique and distinct. *Scenes* define the mood of a story, the tempo and the pace. *Props* might serve as animations, links; in the eyes of children they become alive in the story. Characters and props on the scene can serve as a toy, playground, game, story and/or puzzle. *Sound* can be the primary source of fun, it can also support illustrations and animations and make them more realistic, fun and enjoyable. *Pictures* paint a thousand words and illustration is always a good tool for making fun.

Conclusion

Fun and humour are subjective categories, so from the designer's point of view it is very hard to create a story, an illustration or sound that would be fun for all children. Interactivity plays an important role, but is not in itself fun. Interactivity in the ISS needs a narrative that is properly paced, it needs characters and props, a good visual look, animation and voiceovers. It also needs interesting and fun activities. Furthermore if the user wants to have fun with computer software and applications, the focus of the project has to be on the user. Testing should be done throughout the project and should concern all the aspects of the ISS.

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absolutely crackers: designing an experience

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I have three 'use' words that I frequently use in HCI teaching. The artefacts we design must be:

useful users get what they need – functionality

usable users can do these things easily and effectively

used users actually do start and continue to use it

Technical design has tended to be primarily focused on the first of these and HCI on the second. However, the third is also crucially important. No matter how useful or usable it is, if a system is not used then it is useless.

Internet applications are increasingly elective – users constantly decide whether to continue using them, and have relatively low barriers to change. So the interaction between usability and actual use is more closely intertwined than with more traditional software. Many of these applications are also more about entertainment, community and day-to-day life than 'work'.

We can look at these issues from two angles. First, we find ourselves designing for experience in order to capture and hold users' attention and use. As a case study consider *virtual*

the crackers experience

	real cracker	**virtual cracker**
shared	offered to another	sent by email, message
co-experience	pulled together	sender can't see content until opened by recipient
design	cheap and cheerful	simple page/graphics
hiddenness	contents inside	first page – no contents
excitement	cultural connotations	recruited expectation
suspense	pulling cracker	slow … page change
surprise	bang (when it works)	WAV file (when it works)
play	plastic toy and joke	web toy and joke
dressing up	paper hat	mask to cut out

crackers, a form of 'augmented' electronic greeting card. These have been remarkably successful over two Christmas periods. In order to understand this success we can deconstruct the experience of a real cracker and see how the virtual crackers do not replicate the real cracker, but do capture the crucial aspects of the 'cracker experience'. For example, it is crucially important that virtual crackers do not give an optimal path to the users' goal, but instead a more tortuous navigation route thus adding to a sense of suspense.

Second is the fact that experience is as much about perception as function. This means that we cannot see marketing as something outside the remit of the user interface. In 'work' domains it is a truism of HCI that documentation and user support is part of the delivered product, not just an addendum. In the areas of pleasure and personal choice, we find this is also true of packaging and presentation.

In the case of crackers, both real and virtual, the inner functionality is not significant (a plastic toy), neither is the optimality of the interface (a flap would allow the extraction of the toy without damaging the cracker), nor even the actual physical packaging (crepe paper and cardboard), but within a particular social context the experience of using the cracker is deeply engaging. In the case of paper crackers this may be the result of accident and evolution. In the case of virtual crackers it is by design.

See the associated web page for links and references to related work on the interaction between marketing and HCI and the transformation of products, economics, and society engendered by our information-rich and interconnected world (and other little things like that).

http://www.hcibook.com/alan/papers/crackers2001/

… and of course you can send crackers from:

http://www.vfridge.com/crackers/

The Enchantments of Technology

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Although relationships between people and technology are many and varied, human–computer interaction (HCI) has tended to concentrate on function. However, as concern for measuring satisfaction testifies, it has also long been recognised that there is more to this relationship than task performance. Nonetheless even satisfaction is an inadequate construct for addressing qualities such as fun, pleasure, and enjoyment. As enchantment refers to the relational and aesthetic in people's experiences with a wide range of made objects such as stories, films, music, and paintings, it provides a useful starting point for developing accounts of relationships between people and technology that are not wholly functional.

Enchantment refers to experiences such as being charmed and delighted, and it carries with it connotations of being bewitched by magical powers (Gell, 1992). Teenagers are not just satisfied with their mobile phones. They are bewitched to the extent that the primitive input and output devices on their mobiles matter very little to them. In the magical world of text messaging, where new communication media and the cachet of the mobile are dazzling, enchantment overwhelms function. Can we unpack these 'magical powers' and render them useful in understanding relationships between people and technology?

Gell suggests that enchanting experiences are driven by *delight in the technical accomplishment* evident in the made object. This is the kind of experience that someone seeing a Vermeer painting for the first time might have, a sense of wonder at a moment captured in light. In terms of technology, your experience of time, space, and presence can be transformed by speaking to your young daughter who is on the London Eye when you are at your desk in York. This enchantment is with the possibilities of technology.

Personal experience and a review of other sources suggest that technical accomplishment is not the only defining characteristic of enchantment. The *sensuousness* of a piece of music can elicit a 'gut' reaction that seems independent of technical means. In the world of technology, concern for the look and feel of objects, and the use of emotions, attempt to tap into this dimension of enchantment. When contrasted with the limitations of these 'conventional' uses of technology, the strong sensuous identification sometimes achieved in MUDs is provocative and suggests that an appeal to the sensuous alone may not be sufficient. Along with the sensuous, delight in *identification* with characters and stories – sometimes skewed versions of familiar stories – may be another aspect of what makes mediated interactions and relationships enchanting.

Boorstin's (1990) analysis of the magic of movies suggests that, in a media-savvy world, a combination of wonder at the new, sensuousness, and identification with character is required to create an enchanting experience. Teasing out what filmmakers do to create magic in film he, in effect, replaces Gell's relatively undifferentiated, cognitive approach to seeing with an active, differentiated, aesthetic approach. Boorstin describes three ways of seeing in film, argues that all three are necessary for a film to work, and suggests that there is a different pleasure associated with each of them. The voyeuristic eye is pleased by the new and wonderful and sceptical of the implausible. The vicarious eye attends to the moment of the character rather than the beat of the story and its pleasure is in emotional connection with character and situation. The visceral eye is attuned to the first hand experience of thrill and fear. In contrast with Gell's monological perspective on enchantment, Boorstin's analysis allows us to understand enchantment as dialogical, with multiple perspectives on novelty, emotional tone, and sensuousness in constant interaction with each other against a shifting magic standard.

Thinking dialogically about mobile phones and computers in the context of Boorstin's analysis, we are struck by the

extent to which enchantment is acted out in public space. Our enchantment with mobile phones encourages renegotiation of intimacy and presence. Marketing exploits the public space of enchantment. For example, marketing the Titanium G4 as light, elegant, and slim encourages renegotiation of everyday computing. The response of organisations such as The Billboard Liberation Front, editing Apple's billboard advertisements, raises questions about who owns public space and the power to enchant. This in turn raises interesting questions about the power of the mediation of experience to press into the gap between feelings and expression, rendering what appears interactive as interpassive, with Tamagochi and Cyber acting to serve passivity.

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Expectations and Endurability – Measuring Fun

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Previous work by Read and MacFarlane (2000) identified two ways of recording children's perceptions of their own fun: 'comparative' and 'absolute'. Comparative fun was measured by asking the children to order the activities they had done using constructs like 'easier'. This technique was loosely based on the repertory grid technique (Fransella and Bannister 1977). Children aged 6 and 7 found it hard to differentiate between the four constructs that were offered to them, but for the older children the technique appeared to work quite well. Absolute fun was measured using two different Likert-type scales, one discrete and one continuous. These were modelled on Risden's funometer (1997). Scores using these techniques were generally very high, and this was in part attributed to the 'bewitching' effect of the computer technology that was being used and the tendency for the children to want to please the researcher by rating activities highly.

This paper takes an alternative view, concentrating on the attributes of 'expectation' and 'endurability'. It is hypothesised that fun is related to anticipation and to endurability. For how long something is remembered, and with what enthusiasm, can be an indicator of how much fun it was (Whiteside et al. 1988).

This paper presents work that has recently been done to test these hypotheses and to suggest some more ways of measuring fun with children. Forty-one children were taken on an educational trip, completing questionnaires before and after the event. These comprised three questions and a discrete smiley face Likert-type scale. They were designed to measure the 'expectations' and then the 'absolute' fun of the children.

On two later occasions, the children were asked about what they had remembered and about how much they would like to repeat each activity. These results gave a measure of endurability and gave an indication of the degradation of the memories of the different activities of the event. A repertory grid was also developed with a group of children and was then used to rate the activities of the day. This gave us a measure of comparative fun.

Results indicate that there is a correlation between expected and absolute fun, and that the children typically remembered the activities which they had previously identified as having liked. There is also a correlation between the repertory grid scoring and the desire to repeat the activities. Considering ease of use, completeness of information and the need for metrics that compare one event with another, there seem to be certain combinations of satisfaction metrics which could be used to measure fun with children. In this instance, two Likert scales, a remembrance, and a 'do it again' grid seem to be effective; however, this may be different for a more 'negative' experience.

Whilst the experience evaluated in this experiment was not computer based, the authors believe that the measures of fun might be widely applicable, and they intend to use them to assist in the evaluation of the usability of pen computing interfaces for children. Further work is planned to ascertain whether or not these correlations are evident with less attractive activities.

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The Birth of 'Another Alice'

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'Another Alice' is an experimental fiction video story, designed solely for a new mobile media platform, M-views. The M-Views platform includes an iPaq based PDA, a GPS receiver, an 802.11b wireless card and software agents. Optimized for video, the device facilitates location-aware story making and playback. Compared to any traditional media platform, such as TV, cinema, and streaming media, M-views has two unique features: (1) it knows the viewer's location, (2) it can receive streaming video from an established 802.11b wireless network. M-views provides story creators an opportunity to construct location-aware mobile video stories. In order to trigger the stories, the viewer needs to become more actively involved either by going to the location of the next clip or by activating an object.

The production of 'Another Alice' explores three main ideas:

- How can a simple location-based mobile fiction story be designed and produced?
- What kinds of impact does it have on both storytelling/making and viewing?
- What are other possible forms of storytelling, which are suitable for mobile media systems, such as the M-views?

'Another Alice' is a story in which the viewer is the investigator. There are a number of characters that the viewer

can follow throughout the story. The viewer must literally go to the location where the next clip takes place in order to trigger its playback. Since each character is telling the story from their perspective, each narration is different. The viewer can go back and play the story again, following a different character until the entire story is told. The most interesting part of this production, which sets it apart from the standard 'choose-your-own-adventure' stories, is that time is a limiting factor. The viewer must get from one location to another within a certain time in order to catch one ending of the story. If the viewer does not make it to the location in time, a different ending is shown. This means that the creator initiates the story but the viewer completes it by his/her actions.

The lessons from this production are the impact of text and props. Because the video clip and the dialogue are the only things that the viewer has access to, every word becomes important. But there must still be enough text to create a rich story. Every phrase, movement, object must contain something that reveals more about the character or subtly instructs the viewer to go to the next location.

What are other possible forms of storytelling? The first approach we are taking is to invite different people to create co-existing stories in a certain location, such as the MIT campus. We would like to explore how the viewer can interact with multiple stories at the same location. What are the boundaries between one story and another story? The other approach is to create stories that allow multiple viewers to play collectively. These approaches create new opportunities and challenges, and overall enhance the fun of story making and viewing.

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Jared Spool Lectures

in Edinburgh

Jared Spool, founding principal of User Interface Engineering, the Massachusetts-based research and training firm, will present *Usable Web Design* as the Sidney Michaelson lecture on April 7th 2002 as part of the Edinburgh Science Festival.

Spool will discuss why it is so hard to create a usable website, demonstrating how several breakthroughs have advanced the field and where further work is needed.

More information from http://www.sciencefestival.co.uk/ and http://www.edinburgh.bcs.org/

in London

Jared Spool will give an additional lecture on behalf of the BHCIG on the evening of Monday 8 April, at the Institute of Child Health, 30 Guilford Street, London WCIN 1EH.

More information and booking at http://www.bcs-hci.org.uk/

Jewel in the crown – or bit player?

Has the British HCI community made its mark on the worldwide HCI scene? Formed in 1984, the British HCI Group has had time enough to establish itself, develop a sense of purpose, and create a hallmark. Has this happened? Is there any awareness of our successes and failures beyond our shores?

I invited HCI specialists from around the world to present their candid view of us. In some quarters we have been recognised and in others we have not. Thomas McCoy of CHISIG Australia was not alone in confessing that he, 'must admit complete ignorance of British HCI'. He continues, 'We are, of course, heavily influenced by the Americans (e.g. Nielsen, Shneiderman, Tognazzini, etc.)'. We have achieved less visibility than American HCI folk. However, there were also many respondents who did not associate contributions with different nations and Jared Spool develops this line of thought in his response.

It's no surprise that there is a much keener awareness of British achievements within the British HCI community. We can point to our lead on successful international standards work, and stake a future claim on our potential to take the lead on mobile HCI work.

As the responses to this survey arrived, so my understanding of this community and its achievements shifted. These replies build into an intriguing 'snapshot' view of the state of British HCI.

I think you'll be inspired by what you read here: these messages reveal a potential, and provide a fresh stimulus, to (re)define the agenda for British HCI. Who better than the British HCI Group to lead this (re)definition?

The questions

1. ***Do you consider yourself to be part of the British HCI community? If not, please state where you are based and which HCI community you identify with.***
2. ***What has been the contribution of the British HCI community in the last fifteen years?***
3. ***What might the British HCI community be expected to achieve in the next fifteen years?***
4. ***What would be the most surprising accomplishment of the British HCI community in the next five years?***
5. ***What would be the least surprising accomplishment of the British HCI community in the next five years?***
6. ***Is HCI a uniform practice around the globe, or are there significant regional or national differences?***

View from across the pond

Donald Norman
Professor of Computer Science
Northwestern University and Nielsen Norman Group

Let me give you a response, not necessarily as answers to your questions.

My great admiration and love of British HCI came about through my frustrations. I spent part of a sabbatical year at the Cambridge Applied Psychology Unit, a part of the Medical Research Council, and at the time of my visit, one of the world's leading centers for work on applied psychology.

To my great surprise, amusement, and frustration, the APU was a wonderful example of uniformly bad design practice. Actually, I found England to be a wonderful source of bad design, but more to the point, the part that really got my attention was that nobody seemed to mind. "Oh, yes, I always have trouble with that door/switch/water tap/control panel. So? That's the way it is, that's the way it always shall be."

At the APU world leaders on applications were living in a physical space that violated the very principles they wrote about. "Oh yes, but you know, that's the staff. And they would look unkindly upon any suggestions from us." Class divisions still existed! (When I talked with the staff, they revealed that they were just as frustrated as everyone else and they were delighted that someone took an interest and that they might be able to change things.)

The end result of my stay was to motivate me to action. I started the sabbatical with no goal – just to get away from the administrative workload I had left behind in La Jolla, California. I ended with a goal – to write *The Psychology of Everyday Things* to educate people that they did not have to suffer bad design: bad design was, well, bad, and it could be changed.

Many of the photographs and illustrations in POET are from the APU, Cambridge, and England in general. (I pick on England and spare the rest of Britain because I didn't visit the other parts as much.)

I made many friends at the APU. They were fine scientists, making major contributions to our knowledge. But they were amazingly uninterested in the real world. Pity. When I visited the Human Factors group at Loughborough, I was pleasantly surprised to see how well they had put their ideas into practice even in the design of their building. But not the Cambridge folks.

There are many British centers of excellence. I am particularly fond of work at the OU and at RCA's Computer Related Design group. But there are excellent centers all throughout Britain from Scotland to Sussex.

Dr. Deborah J. Mayhew
author of *Cost Justifying Usability*
and president of Deborah J. Mayhew & Associates in Massachusetts

Thanks for thinking of me, but I really do not feel qualified to comment. I am not a part of the British HCI community, do not keep tabs on their contributions (this reflects on me rather than on them!) and am no historian or visionary! :->

Best of luck with your survey!

[Editor's note: Deborah's response was echoed both by an employee at a very big American software company (something like McSoftware) and by an American academic who has published influential books on user interface design during the last fifteen years.]

Scott Weiss
Principal of Usable Products Company, New York,
and founder of the Wireless Roundtable

1 I am a peripheral member of the British HCI community due to my research into handheld user interfaces and usability. I have enjoyed setting up and participating in two meetings of the Wireless Roundtable in London (wirelessroundtable.org). Collaboration with British HCI professionals has been instrumental for my work for *Handheld Usability*, a John Wiley & Sons book to be published this Spring.

2 The British HCI community has been an outstanding contributor to HCI publications and to raising awareness of usability issues. British HCI professionals have been particularly effective at 'getting the word out'. British design of all sorts appears to have usability in mind, as it is almost always well thought out.

3 The British HCI community could be expected to achieve national usability guidelines and standards for software and hardware design, and a recommended process for achieving those standards.

4 The most surprising accomplishment would be success for WAP. I feel that the British are the most likely HCI professionals to contribute to that success. If it happens – and it will be a surprise due to the inherent usability limitations of the platform – it will be a direct result of British HCI research and design.

5 An annual British HCI conference that is attended by HCI professionals from all over the world. I think the British HCI community is heading in that direction right now, so it will not be much of a surprise if it does happen.

6 HCI practice is similar in the US, UK, Europe, and Australia. HCI practice is very different in Asia, the Middle East, and other areas of the globe. The differences are cultural. While the areas in which HCI practice is similar have many significant cultural differences, HCI practice itself is quite similar.

Jared Spool, UIE

I have to admit, I'm not sure I have an opinion about British HCI. I don't really separate HCI efforts by nationality, so I couldn't tell you which contributions are British vs. other.

I'm wondering if this is because we live in a time where geographic association with contributions is not really necessary. When it was harder to get concepts "across the pond", the effort it would take to integrate thinking made us very aware of where things were coming from.

Now, I get an email from an unrecognized URL and I have no idea what continent that message originated from.

The planet is smaller. How do we balance our need for national pride and justification of investment with the homogeneity that our new communication society presents?

1 Do you consider yourself to be part of the British HCI community? If not, please state where you are based and which HCI community you identify with.
2 What has been the contribution of the British HCI community in the last fifteen years?
3 What might the British HCI community be expected to achieve in the next fifteen years?

Jurek Kirakowski, HFRG, Ireland

1 I live and work in Cork, Ireland. My view has always been more towards mainland Europe than the UK, and in the past ten years or so, the US. The reason for this is twofold. In the earlier days, in the 1980s, British HCI was dominated by academic approaches with little industrial relevance and feared quantification as if it were the devil's spawn. Nowadays, there are a lot of 'young turks' on the scene, which has been fuelled by the internet revolution, and the quality of their work is variable – there are some very good practical contributors but it still feels as if there is a definite prejudice against actually trying to measure anything, least of all the results of one's own work. This contrasts with other areas of Europe and certain parts of the US where measurement *is* taken seriously. I find it difficult to identify with people who are not interested in measurement, however broadly defined.

2 Largely infrastructural. The HCI community in the UK has not contributed great leaps forward either conceptually or practically, with the exception of the work done on standards and accreditation. The British HCI community has however fostered the sense of community, and that is worth a lot.

Looking at surveys such as Jenny Preece and Alan Dix and their respective colleagues have done in their introduction to usability books one is always struck by the paucity of ideas and threadbare concepts. To a certain extent this has created a 'ghetto' mentality in which we all talk to each other in a language that seems to become increasingly difficult for outsiders to interpret and we're scandalised by how little impact we have… whose fault is that?

3 One of the things that really depresses me is that there is all this talent in British HCI that comes up from the universities – they present really exciting papers at conferences, maybe even get one or two published, and then they get a job. Boy, does that really shut them up for good as far as making a contribution to the science goes. To develop specialised tools and methods that are the professional stock-in-trade of the HCI practitioner, to develop insights beyond the common sense: those would be prizes worth working hard for. But it's impossible given that our brightest soon go to jobs where they're focussed on getting the alligators out of one swimming pool after another. They have to, of course, to pay the rent. If there were only some way one could devise to encourage HCI researchers to stay the course, to run the necessary six or seven or ten years it takes to bring something from the 'what a great idea' stage to the professional specialised tool stage, where use of the tool enables you to work more efficiently, or provide a better service to your client.

4 That we all agree on professional standards of what it is to do a job of work in HCI well. If in 5 years time one could point to documents or websites of whatever and say: 'this represents consensual good practice throughout the UK HCI industry', I would be delighted. That would certainly help us get out of the 'HCI ghetto' and foster the view that HCI practitioners are experts with something to contribute.

5 That we all wear lapel badges to identify ourselves as HCI practitioners to each other and that while attendance at HCI conferences grows, attendance of usability experts at non-HCI conferences diminishes.

6 There are many varieties of HCI. Variation is caused not so much because of local differences at a conceptual level (i.e., different people think HCI is different things) but because of the differential maturity of the regional markets in which HCI folk work – so if you're trying to sell HCI services in Portugal you're going to be offering services of quite a different kind than if you're going to be doing it in Austria let alone Sweden. Your clients in the more southern countries are going to be less ready to accept HCI in a practical sense, although they will be very interested to hear about it from a theoretical point of view.

I have also found that the sex ratio of people engaged in HCI favours women the closer one is to the equator. I propose this as an observation, not a prescription.

View from South Africa

Jacques Hugo, CHI-SA Chair, and Usability Sciences Consulting CC

1 In spite of our heritage, the fact that we speak 'British English' and that we are part of the Commonwealth, South Africa's African identity is growing stronger by the day. As far as HCI is concerned, we believe we have unique needs and problems that cannot be adequately addressed through an association with our British counterparts. Furthermore, through our alliance with SIGCHI (i.e. as a local Chapter), the South African HCI community is currently much closer to the American HCI community.

2 I'm not in a position to comment on this as I have never had any association with them or the BCS. What I do know though, is that they are probably the most authoritative HCI group in the European/UK community. Note also that the BCS in general, and the HCI Group in particular, are practically invisible in South Africa (not to mention the rest of Africa!) Only a few academics and practitioners with a long standing in the field know about the existence of the HCI Group.

3 To not only continue pursuing development of the field through stimulation of R & D, but to build bridges between all sectors of the community and industry.

4 To persuade the entire IT industry, commercial sector and governments that HCI is an indispensable part of any computing environment, to the extent that HCI and related practices have become institutionalised in all development endeavours.

5 To at least maintain their current status quo.

6 There are important differences, especially in developing countries where scarcity of resources is one of the biggest inhibiting factors in the development of the field. In addition, in certain regions, especially those with significant educational, cultural, economic, political or infrastructural diversity (e.g. Brazil, South Africa, etc.), there are important focus shifts in the way HCI is taught and practised.

View from Europe

Costin Pribeanu, SIGCHI Romania, and National Institute for Research and Development in Informatics, Bucharest

1 I am part of the Romanian HCI community, a local sig chapter of ACM SIGCHI.

2 I don't know the community nor its achievements although it is likely that I read many papers written by its members.

3 I wonder if it is associated/affiliated to ACM SIGCHI? If not, why not? From my point of view, it would be good to integrate its efforts with other chi groups in Europe and to share experience with new (young) HCI communities.

6 I think there are many differences. Rather than being national or regional they are mainly located within organization: from paying no attention to HCI (the worst) to highly specialized usability practitioners and usability laboratories.

4 What would be the most surprising accomplishment of the British HCI community in the next five years?
5 What would be the least surprising accomplishment of the British HCI community in the next five years?
6 Is HCI a uniform practice around the globe, or are there significant regional or national differences?

Gilbert Cockton, Professor, University of Sunderland, and Chair, British HCI Group

1 It's a fair cop. As the new UK representative to IFIP (IT's FIFA) Technical Committee on HCI (TC 13 for trainspotters) and chair of the British HCI Group, you can't get much deeper into the UK HCI community. As a fellow of the British Computer Society, I'm comfortable with the position that HCI is primarily an issue for the IT profession. Bringing HCI to mainstream software development is bound to have more impact than the brave efforts of a few committed specialists, even if they are my international drinking colleagues of 1.5 decades standing.

2 Spreading the word on HCI through HCI education in universities, establishing Human Factors as a key research area within EPSRC, and making HCI skills key to business competitiveness in leading IT suppliers such as NCR, IBM, Logica and BT, as well as in user organisations such as the Employment Service and some banks and building societies.

3 An understanding within the private and public sectors of how to achieve quality in use, rather than the all too common declarations of the importance of usability and appropriate interaction design without any real understanding of what it takes to ensure these.

4 Mandatory Quality in Use standards for public information systems.

5 An annual of usability horror stories.

6 HCI has attached itself to different disciplines worldwide with clear impact on research and practice. In the UK, France and Germany, HCI has established good synergies with software engineering. In Scandinavia, HCI is shaped by a strong information systems tradition. In Brazil, the humanities have influenced Systems Design through a focus on semiotics. In Australia, the Ergonomics community remains dominant. In the US, there's a free for all where anyone can add a new method to the HCI toolbox. As a contextual discipline, HCI will always adapt to local conditions, although this can lead to stagnation and conservatism (in the US a Usability Engineering preservation society is already in the making, dedicated to keeping HCI in the discount methods phase of its development).

Alistair Sutcliffe, Centre for HCI Design, Dept of Computation, UMist

1 Yes […] I also do work in requirements and software engineering that are not part of HCI but arguably should be.

2 Founding a strong academic and industrial community – the BCS HCI Group. Organising the BCS HCI conferences which have become the *de facto* Euro CHI.

Raising awareness of usability engineering and usability as a quality issue in industry.

Improving the practice of user centered design and evaluation in British industry.

Contribution to HCI standards – ISO 9241, 13407, 14915.

Research in HCI theory (AMODEUS, TKS and beyond).

Research in methodology (MUSE, task analysis, etc.) but application doubtful.

Research in CSCW, VR and Multimedia.

Technology transfer – HUSAT and others.

3 Development of HCI theory research and effective application to design.

Consolidation and spread of usability engineering in industry. Development of current research in mobile/ubiquitous computing to compete with USA.

4 If it took the lead in becoming the focus of multidisciplinary systems (socio-technical) engineering and became the design discipline subsuming and improving weaker research and practice in software engineering, interaction design, systems engineering and socio-technical systems design.

5 If it just plodded along organising conferences and doing more of the same.

6 No and of course. Not much real HCI in Pacific rim (Australia and New Zealand excepted). European coverage varies – viz Scandinavian user centred tradition well known, France, Netherlands stronger, HCI weaker in Germany and Italy. USA dominance in CHI community but technology focused.

Andrew Monk, University of York

2 Developing engineering methods is an international cooperative activity so it is hard to identify a unique contribution for 'British' HCI. The two areas where we have had a disproportionate influence are standards and formal approaches. The international standards ISO 9241 and ISO 13407 demonstrate the maturity of HCI as a discipline (see my article elsewhere in this issue for more details).

Tom Stewart, Nigel Bevan and Jonathan Earthy (amongst many others) have been particularly influential in getting this done. The other area where we have had a disproportionate influence is formal approaches to specification. This work has given HCI added respectability in the computer science community. Here former and present colleagues at York are the first to come to mind, Michael Harrison, Alan Dix, Harold Thimbleby, though again there are many others.

3 A leading reputation in the design of ICT for use outside of the workplace – well that's my personal goal.

4 Better salaries for academics.

5 More papers.

6 We tend to spend more of our time analysing things than other HCI communities. Analysis is good but we also need to spend more time actually building things. If this is to happen the attitudes of major funders such as EPSRC need to change radically.

View from within

1 Do you consider yourself to be part of the British HCI community? If not, please state where you are based and which HCI community you identify with.
2 What has been the contribution of the British HCI community in the last fifteen years?
3 What might the British HCI community be expected to achieve in the next fifteen years?

Alistair Kilgour, Professor Emeritus, Heriot-Watt University, Edinburgh

2 William Newman was the unacknowledged founder of HCI long before the subject had been identified – this goes back more than fifteen years, to a time when interaction was just part of computer graphics. William's 1969 PhD thesis at Imperial College, and the work that flowed from it, was just as ground-breaking and revolutionary in its way as Ivan Sutherland's earlier, and much more widely known, 'Sketchpad' thesis of 1963. Another key British pioneer was Steve Draper – his UCSD book with Don Norman, first published I think in 1986 (slightly before the 15 year window) marked the beginning of HCI as we know it today. Although the book was written when Steve was working at UCSD, I think it's fair to claim at least half of it as a major British contribution.

The third under-honoured British HCI prophet (at least in his own country) is Thomas Green. He has been a continuous source, over the last fifteen years and more, of creative, original and deeply insightful ways of looking at and analysing the cognitive aspects of interaction.

Thinking further about the outstanding personalities of British HCI over the last fifteen years, what strikes me in particular is how many genuine polymaths we have produced. Coming myself to HCI from a computer science angle, the people I admire in particular are those who achieve success and recognition both as 'serious' computer scientists, and as HCI pioneers. I am thinking of people like Russell Winder and Fintan Culwin – programming language gurus par excellence also making significant contributions to HCI.

Paradoxically, though, maybe the major contribution of the British HCI community has been in education, and in raising awareness in the scientific community and the public at large. Just about every UK university Computer Science syllabus now includes HCI, and it is close to being accepted everywhere that designing for usability is a central and indispensable aspect of software engineering.

The annual HCI conference series has also made a major contribution to awareness-raising, creating excitement and generating attention for the subject. This is where the community as such has been seen at its most professional and most effective. (It's ironic in this respect that for most of the people who do it, contributing time and energy to conference organisation is not part of their job – they do it for love of and commitment to the subject, and from a belief in the importance of spreading the message – though of course they also like having a good time.)

3 Within the next fifteen years there will cease to be anything identifiable as the 'British HCI Community'. Though there are a central set of ideas which we can gather under the heading 'HCI', there is still dispute about exactly which ideas qualify for inclusion, and the acronym itself still (notwithstanding the proselytising successes of our conferences) evokes complete mystification among the public at large. (In my part of the world people think, if anything, it stands for 'Health Care International'.)

The different strands of HCI will be absorbed into the appropriate disciplines – in particular the interactive (computer) system design part of HCI will be absorbed into computer science in general, and software engineering in particular. Looking back fifteen years from now, it will seem as unthinkable then that new technical products or systems were launched in the nineties with no thought given to usability in the design, let alone iterative usability testing before release, as it is today that in the seventies and eighties, until the advocacy of pioneers like Ralph Nader, cars were promoted and sold with no regard for or prior testing of their crash impact and safety characteristics.

4 To make a difference to the design of the next generation of mobile phones.

5 To produce masses of research papers on problems with current mobile phone interfaces – too late to do anything to improve them.

6 No it's not uniform – there is more psychology and human factors in the various European strands. And HCI is spelt CHI in the US – just one of the many differences between the British and US versions of English. In the next five years – before HCI begins to fade as a separately identifiable discipline – it's likely that the North American and European varieties will differentiate further – one small example of what I expect will be a growing cultural divergence between Europe (including UK – whether or not we join Euroland) and the US, following from, and related to, increasingly divergent responses to September 11th.

Dr Andy Smith, Head HCI Research Unit, University of Luton, and Exec. Cttee. Member British HCI Group

4 'Mainstreaming HCI and usability' – as a practitioner/consultant, the ignorance of the importance of HCI/usability within the 'new media' industry still surprises me – it would be a real achievement if both e-commerce/marketing managers and design agencies were able to embrace usability as a key determinant of success.

6 HCI is certainly not uniform around the globe and this is a major challenge. In Europe and the USA usability is seen to be 'mission critical' in the quality and success of IT systems. HCI is a standard part of degree courses in computing throughout Europe and the USA. 'Usability engineers' are common in software development companies in Europe and the USA. This is not the case in India for example.

The Indo British Software Usability Partnership has been established to support the effective development of sound usability principles in Indian academic and commercial information technology activities. In addition it plans to identify and address Indian cultural requirements for interface design, thereby assisting in the provision of local software for Indian computer users.

The IBSUP feels that improved usability within the whole Indian IT industry will improve the global competitiveness of the Indian IT industry. An enhanced understanding of the cultural requirements for usability will ensure more effective systems that are localised for Indian users.

4 What would be the most surprising accomplishment of the British HCI community in the next five years?
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Tom Stewart, System Concepts

1 Yes, both at an individual and company level. System Concepts is definitely part of the British HCI community and much of our HCI work takes place in the UK. However, we are increasingly working in Europe and the USA and through organisations like SIGCHI and my work in International Standards I feel much more part of the wider international HCI community. I also think that HCI is really a coalition of several communities and I certainly stray into the ergonomics and applied psychology communities also. But such diversity makes it interesting.

2 My slightly rude answer is that the contribution has not been as much as it should be. This is partly our own fault for being too inward looking, not sufficiently business-like and rather 'ivory towered' at times. However it has also been due to short-sighted management, an excessive focus on time and money rather than quality in product design and few British software companies taking HCI as seriously as our US competitors.

3 I think the work we have done on usability standards (which have taken even longer to develop than the BCS HCI Group has been in existence) has finally started to deliver the kind of credibility which management will take seriously. They have created an opportunity for HCI to become a formal part of most projects and this might allow us to become recognised as just another part of the team rather than an exotic luxury which few can afford.

4 I would be very surprised if HCI became so popular that HCI 'gurus' became as familiar as TV chefs.

5 Depressingly we could still be arguing about qualifications, certification and other essentially inward looking issues.

6 Although I believe there is a strong international community in HCI, there do seem to be different national flavours and interests. For example, the Scandinavians have a long history of interest in human-centred design methods and user participation in design. The Germans seem to have a strong interest in software tools for assessing usability whereas the Japanese are doing very interesting work on innovative interfaces (perhaps because Kanji keyboards are a bit of a nightmare). But as I said in answer to the first question, I think the diversity of HCI around the world is one of its main strengths and I hope the British HCI Group will continue to be outward looking and international in its approach.

Jonathan Earthy, Lloyd's Register (but speaking personally)

1 I used to consider it my 'home ground', but in the last seven or so years my professional interests have extended from IT to include safety and systems engineering. As such the broader community of Ergonomics is becoming a more relevant grouping to me.

2 A progressive and pragmatic research programme that underpinned the new discipline of HCI. Radical change in the teaching of IT – extending it to include consideration of user issues and establishing interface design as an important part of system development. Hosting, if not recognising, the establishment of usability as a measurable and improvable system quality. Providing the majority of technical input to the international standards for software ergonomics and user centred design. A dependable conference with international recognition. In the 1980s a superb day meetings programme that catalogued and disseminated the evolution of thinking in the new discipline.

3 Re-integration with its parent disciplines. Professional recognition for practitioners. Application-related specialisation. Take-over of software engineering.

4 Integration of the Usability and HCI communities.

5 Good research, sound teaching, a dependable conference with international recognition.

6 Definitely not uniform. HCI (CHI?) is a broad church with significant diversity, based largely on cultural differences. It also seems to have (so far) changed with time. Whilst the diversity caused by innovation, research and culture is probably here to stay – and welcomed to do so, ISO 13407 should encourage a needed base level of common practice in the application of HCI knowledge to system development.

David Benyon, Professor of Human–Computer Systems, School of Computing, Napier University

2 Contribution to what? I think we are finally seeing industry starting to take usability seriously. The professional association in Scotland (ScotlandIS) has just established a usability forum and website and this is creating some widespread interest and participation. Of course the likes of Nielsen and Norman have done a great deal to raise the profile worldwide, but in the UK BCS HCI has achieved a lot.

Theoretically we have achieved rather less, perhaps, and I would certainly like to see more activities in the community aimed at elaborating theoretical positions in HCI.

3 That's an interesting one. The next period will see the growth of ubiquitous computing and, I fear, a great deal of chaos as competing protocols and digital devices interfere with each other, so people will not know what device is doing what or what it is capable of. So there's the challenge for HCI – theory and practice. The community will have to stop looking at a person interacting with a device and start to consider these landscapes of information appliances. And we do not have any methods for this yet.

4 A Nobel prize.

5 A paper on task analysis at the annual conference.

6 There are significant differences – even between places like Scotland and the rest of the UK… but with NordiChi and OzChi and the CHI visits to Europe, ideas and principles are gradually spreading. We will get there and usability will sit alongside functionality and people will take a user-centred approach to design. Certainly in the next 15 years.

View from within

putting the questions and collating the responses was Alex Dixon
adixon.hci@ntlworld.com

‘Not with a bang but a whimper.’

Cassandra Hall

One of my dearest friends, in terms of emotional closeness not in terms of cost because she’s actually very cheap to have as a friend, has had a paper rejected at a conference that I shall call HIC because what has happened is politely known as a hiccup. Though if you ask me it’s more like something a bit lower down – but this is a family magazine and just because the editor is on holiday I shan’t resort to lewdness.

Anyway, the darling has had her paper rejected. She wasn’t surprised. She’d submitted the thing expecting a rejection but she’d heard that HIC rejections were worth having so thought she would go for one. Sure enough she got her wish. It was, as people had said, quite useful. She went around saying nice things about HIC and their nice, friendly and useful reviews.

Four days later a second e-mail arrived, again telling her that the paper had been rejected and apologising for an incomplete review which had missed off the meta review. The e-mail was at pains to say that the paper had still been rejected and HIC was sorry about the confusion. Later the same day came yet another mail with yet another rejection but news that one of the reviews was incorrect and an amendment was attached. This again apologised for all of the other rejections which it said were erroneous and now attached the proper rejection with the proper reviews which were the right ones. Again, HIC apologised for any confusion they may have caused but by now my friend believed that it wasn’t her that was confused at all though someone clearly was very unhappily perplexed by it all.

Yes, I know, it’s complex. My friend leads a complex life, silly girl. But not as complex as HIC, it seems, which gives a whole new meaning to that much cited poem by Stevie Smith, ‘Not Waving, But Drowning’.

These things happen. My friend doesn’t smirk. She isn’t that type. Naïve and trusting, I’d say, but definitely not a smirker. But she told me and I did because I am that type. I reminded her that she’d had a lot of trouble submitting the thing in the first place because the site was too difficult for her to use. She told me she always had trouble with things like that and I told her HCI experts were users too and she should stop being a WIMP. A site that takes 20 minutes to figure out how to submit to has a serious usability problem and she hadn’t actually achieved the submission without considerable help from the chairs. Besides, it was an HCI conference site and usability should come as naturally to HIC as hand washing comes to a surgeon.

Set yourself up as a world leader and arbitrator in something and you have to accept the consequences if your own behaviour falls short of what is to be expected of the super hero. Can you imagine feeling respect for Superman if he pulled the ears of puppies and stole old ladies’ umbrellas? And where would the admiration for Buffy be if she put off slaying when she had PMT? And no you can’t appear in public minus make-up and with a spot if you’re a model. Best hide out till it goes. Call yourself an Interface Guru and your interfaces have to be beyond reproach. Set up structures that make a plate of spaghetti look straightforward and you had better put down plenty of cushions for the fall.

Act as if you’re a premier HCI conference and all of your processes better be user friendly and effective and fair or people like me are going to be pulling you apart pretty sharpish. I won’t say that we’ve been waiting for the opportunity but I’m not exactly weeping into my Kleenex Super Soft. My friend may not wish to cast the first stone but I have no such compunctions. And I do have a big pile of brickbats just waiting because actually I’m pretty sick of the holier than thou attitudes where ‘big’ is seen as synonymous with ‘the last word in’… And where newcomers are treated in a way that makes the guys who stepped over the bloke finally rescued by the Samaritan look positively decent. Anyone who can stomach all that condescension in one place has my admiration.

I’m afraid that the higher you set yourself up the further the fall and the bigger the smash and the more people to gloat over the fragments. My friend might be forgiving but she didn’t have to listen to herself being upset about what her reviews actually were and whether finally she’d got the right review. I wouldn’t trust HIC to organise a drunken orgy at a place for the production of beer, especially if Bacchus was going to be the guest speaker. Too embarrassing darling! And I have to go even further. If I can’t trust the output how do I assess those hidden bits where the quality control may be even more whim-like and error prone than the bits I can see?

You may be thinking I’m being uncharacteristically uncharitable but the story doesn’t end there. Over a month after the review process seems to have shuddered reluctantly to a halt, my friend received an e-mail thanking her for querying the meta reviews and the review process and stating that all was indeed as the reviews said and the paper was rejected. It added rather curtly that so far as the two chairs were concerned that had to bring the matter to a close.

Nothing odd about that except my friend hadn’t mailed them. As I say, she isn’t that type. Put her in a plummeting balloon and she’d argue herself out of a place. She mailed a reply saying that they should check who had mailed as it certainly wasn’t her and she thought there had been some misunderstanding. Given that there had already been some confusion over the reviews she had received she wondered if there had been a mix up with her paper and the other paper again. She is a simple soul who believes in coincidence. There were 400-odd submissions (so they say) to that conference. I wonder what the chances are of one submission receiving three feedback errors? But then, maybe it’s all the fault of my friend who as I say does lead a complex life. The poor child is now going around anxious that HIC thinks she’s some sort of moaning Minnie. That’s it, when systems fail, blame the user!

Incidentally, the e-mail from this other mysterious rejected paper writer to the two chairs was an interesting one. My friend had it quoted to her even though she hadn’t written the original of course. The tone was brisk to say the least. The two I am sure charming and flustered chairs – let us call them Eleanor and Wallace – had signed off in a friendly fashion, Nelly and Wally, only to have their inquisitor address them in the cold shower equivalents of formality. Thank heavens no one ever shortens my name. I had no idea such destruction could be wreaked with a swap between the two forms.

I tell you what. I hope I never have to reject that writer. That paper may have been rejected by HIC but the writer has a mind like an oiled steel trap and made Aliens look positively friendly and welcoming. Although the two charming chairs hoped the writer would come to some large shopping

▸ *continued* ▶▶

Noddy's Guide To Usability

Andrew Monk

Andrew Monk stepped down after several hard-working years as chair of BHCIG recently. Now he's got all this time on his hands, we invited him to write one of our ever-popular 'Bluffer's Guides' – a 500-word guide to some aspect of HCI.

Below we see something much bigger – the 'Noddy Guide' is this magazine's term for altogether more comprehensive introductions to the field. But (as with a Bluffer's Guide) you don't need prior knowledge to start understanding, and you'll know a lot more by the end.

Hopefully all good Noddy Guides raise hackles amongst the PC Plods out there, and we are always happy to afford other guardians of HCI tradition their right to reply.

The progress that HCI has made in the last twenty years is simply amazing. HCI research has had an enormous influence on the software products that everyone takes for granted. For some reason, and I guess you have to blame the educators here, we often sell ourselves short. There is theory, there are methods and together they constitute a body of work that has changed the world for the better. We can engineer usability. Read on to see how.

What is HCI and what is usability?

Not everyone reading this article will know what HCI is. I should start at the beginning. Human–Computer Interaction (HCI) began as a discipline in the late 1970s and early 1980s. Initially it came about through an alliance between Computer Scientists and Psychologists. Since then Ethnography, Ergonomics and Activity Theory have all been recruited to the cause [14]. HCI research is concerned with how to ensure usability, that is to say, products that are effective, efficient and satisfying to use. HCI researchers try to understand what users want to do and how designers can be helped to provide products that satisfy these needs.

ISO 9241 and Visual Basic are theories of usability

Table 1 lists the parts of the international standard ISO 9241. Parts 1 to 9 are broadly ergonomic but parts 10 to 17 are directly concerned with HCI design, how to ensure usability. An international standard has the weight of law behind it but perhaps a more commonly used form of standard is the 'style guide'. This rather misleading term is taken to mean a set of guidelines describing how a graphical user interface should work: for example, what a dialog box should look like, how it should behave when the user interacts with it and when it should be used rather than some other device such as a menu. Apple produced the first style guide in 1987 [1, 2]. There are now style guides for all the commonly used graphical user interfaces (GUIs) including Microsoft Windows [11]. Style guides are supported by software tools. Thus a software developer using a programming tool such as Visual Basic will find it very much easier to obey the Microsoft Windows style guide than to ignore it. This prevents them from developing idiosyncratic interfaces that do not behave in the way users are used to. At the very least, by enforcing a degree of consistency in this way, style guides ensure that when a user learns to do something in one context that knowledge will transfer to new contexts in a sensible way.

Table 1. *ISO 9241 Ergonomics requirements for office work with visual display terminals (VDTs)*

Part 1 General Introduction
Part 2 Guidance on task requirements
Part 3 Visual display requirements
Part 4 Keyboard requirements
Part 5 Workstation layout and postural requirements
Part 6 Environmental requirements
Part 7 Display requirements with reflections
Part 8 Requirements for displayed colours
Part 9 Requirements for non-keyboard input devices
Part 10 Dialogue principles
Part 11 Guidance on usability specification and measures
Part 12 Presentation of information
Part 13 User guidance
Part 14 Menu dialogues
Part 15 Command dialogues
Part 16 Direct manipulation dialogues
Part 17 Form filling dialogues

So where did these standards and style guides come from? The answer is, from years of painstaking HCI research. One of the first set of guidelines by Smith and Mosier [20] referenced all the papers that led to each of their 944 guidelines. As time went by authors concentrated on the guidelines and stopped providing the references but the research knowledge drawn on is there all the same. Style guides, and ultimately software tools, encapsulate a great deal of empirical and analytic work carried out by HCI researchers to find out what

▶▶ *continued from page 30* ▸

mall where the conference is to be held, to be honest, for their sake I hope he doesn't. To be even more honest, I'm not even sure if I trust HIC to have got the venue right, and when that guy turns up he could be pretty mean.

Anyway, as I smirked my way through the story my friend had to tell I thought of those innocents tucked away in London, organising the next British HCI conference and sentences like 'Pride goes before a fall' rang in my head. I guess I'd like to pass on some advice. Mess up things by all means but don't mess up bits where you have to deliver bad news. Hell may have no fury like a woman scorned but it'd be hard to find fury like you get in an HCI academic whose latest paper has just been rejected, and some of those guys are damned bright and argumentative.

It could be that HIC can actually organise a contest for the throwing of small, bread-like confectionery in a building set aside for the production of loaves but I'm not putting any money on it. To be honest, I've always doubted the wisdom of putting academics in charge of organising things. The ones I know have difficulty remembering who they are without a business card. But then back seat driving was always my forte. And to be fair, there's nothing quite so easy or as self satisfying as standing in the terraces shouting instructions. Especially when the match is over.

actually was the best way of doing things. In that sense they are theories of HCI. A software tool such as Visual Basic even meets the formal definition of a theory in that it constrains how something (a user interface) may look and behave. It constrains it in such a way that it is more effective, efficient and satisfying to use than it would have been if the design had not been constrained in this way.

Principles of human–computer interaction

Early work on the effective use of graphical user interfaces was concerned with establishing higher level principles for good user interface design (see, for example, [10]). These principles are the basis of the more detailed style guides and are often reiterated in them. Take, for example, the principle of 'reversibility'. One of the problems users had with early interactive systems was that they did not encourage exploration. Carroll and Carrithers [4] describe how users might spend several minutes recovering from the wrong choice in a menu. To avoid this, style guides prescribe a variety of devices for undoing the unwanted effects of actions taken by a user: e.g., the 'back' button in a web browser, the 'cancel' button in a dialog box, or the 'undo' function in a word processor. All these features follow the principle that the effect of any action that a user takes should be reversible. Users should be able to take this as given and where it is simply not possible the user should be warned before they take the action in the first place.

Another valuable principle that has been analysed in some depth is action–effect consistency (see my previous Noddy's Guide to Consistency, *Interfaces* 45, 2000; available from *http://www-users.york.ac.uk/~am1/ftpable.html*). This states that if the user takes some low level action it should have the same effect whatever the context. For example, pressing the delete key or clicking with the mouse should have the same effect whether one is editing a file name in a dialog box or editing the text in a document. Another way of expressing this principle is to say that interfaces should be 'mode free'. In practice some degree of 'modedness' is inevitable and the question is how to predict when modes will be a problem and how to signal them to the user [9].

Principles concerned with consistency in one form or another have been a recurring theme in HCI. 'Task–action consistency' [17] is an attempt to optimise the relationship between a user's view of the task they are trying to complete, e.g. drawing a square, and the set of actions they need to take in order to complete that task. People expect tasks that they view as similar to require similar actions. Thus the actions required to draw a square must be consistent with the actions required to draw a circle.

Many of the problems people have with the new forms of interaction needed to work mobile devices such as cell phones can be readily understood, and fixed, by applying these principles and there is currently a renaissance in this research on design principles.

Internationally agreed methods

Do you know how an international standard comes about? First a committee of experts, some of whom may be academics, writes down an agreed form of words – seems unlikely but they do. Then, and this is the staggering bit, they send this form of words to lots of other people, in different countries and with different vested interests, and these people 'vote' on whether they agree with it too. If everyone does then the standard is published. Knowledge encapsulated in an international standard is mature knowledge. Everyone agrees it is right.

There is this level of general agreement on the processes needed to ensure effective user-centred design. The international standard ISO 13407 ('*Human-centred design processes for interactive systems*') specifies just what it says in the title. The same level of agreement can be seen in HCI text books [6, 18] and in published methodologies such as *Contextual Design* [3] and Monk's Light Weight Techniques [12, 15] (Do we allow this kind of blatant plug? – *Ed.*). These common elements are illustrated in Table 2 and the following paragraphs describe them in a bit more detail.

Table 2. *Common processes in user centred design*

Understanding the work context
Methods: focus groups, interviews, observation
Representations: the rich picture
Understanding the work
Methods: focus groups, interviews, observation
Representations: HTA, WOD and exceptions, scenarios
Testing a top level design against your understanding of the work
Methods: Scenario walkthrough, Cognitive Walk Through
Representations: Story boards, dialogue modelling
User testing of more detailed prototypes
Methods: Usability Labs., Cooperative Evaluation
Representations: Paper prototypes, simulations

Many computer systems come to grief because they are not designed to perform the right functions and so it is important to get human factors input into the earliest stages of requirements analysis. The first two processes depicted in Table 2 are concerned with understanding the work context and the work to be supported. *Understanding the work context* involves identifying all the stakeholders and their concerns. Computer systems change the way people work, otherwise there would be no point in introducing them. It is thus possible to provide a system that supports one person's work very well while having side effects on the way work is done that make another person's work difficult or even impossible. Only by identifying all the people that could be affected by the introduction of the new system, and their particular concerns, is it possible to avoid this kind of problem.

Understanding the work. Once the design team has gained a broad picture of the work context they can focus on the particular work to be supported by the computer system. As with the work context, the data used to do this will come from interviews and observation in the workplace. Typically some sort of representation will be used to record and reason about the way the work proceeds. The two most commonly used are Hierarchical Task Analysis [19] and scenarios [5]. A scenario is simply a story that takes the reader through the steps taken to perform a work task described at a fairly high level. It should include details obtained from the analysis of the work context, such as interruptions and parallel tasks not to be supported by the computer. In general, several scenarios will be needed to cover the most important variations in the way work may be completed.

Testing a top level design against your understanding of the work. The next step is to build a model of the high level structure of the user interface. This will omit many details of screen design but will describe how a user moves from one task to another. This 'dialogue model' [12] can be evaluated

against the representation of the work to be supported. For example, one can go through the scenarios checking that all the work tasks can be completed and that the way the operator has to work is efficient and fits in with the larger job.

User testing of a more detailed prototype. Finally, a detailed prototype of the user interface is built and tested with real users. Much can be done at early stages using mock-ups or paper prototypes before any code has been written [15]. There are also usability inspection techniques that can be applied to a user interface specification [16]. In this way one can ensure that the user interface will communicate the designer's intention to the user effectively.

Different authors describe these four processes in different ways, and some add bows and frills of various kinds. However, they all agree on the basic steps, what they are to achieve and the order in which they should be carried out. The disappointing thing is that not everyone out there uses them. Perhaps the real challenge for HCI is convincing people that we know what to do and that it is worthwhile to do it.

The future: broadening the concept of usability

The HCI knowledge I have described is old stuff and applies mainly to graphical user interfaces for office systems. Mobile and ubiquitous technologies are taking the computer out of the office into the street and into the home. Suddenly the landscape is unfamiliar. It took ten years to get from the first papers describing the problem of designing interactive systems for the workplace (see, for example, [7]) to the first papers describing key concepts and methods (see, for example, [8]). It took a further 10 years for the area to mature to the extent that there was sufficient consensus for clear standards to emerge.

It is to be hoped that our understanding of this new stuff will take less than 20 years. It is no longer hard to convince the people who matter that HCI issues are crucial to the success of their product. Also some of the old stuff will still be useful. Our research at York is to broaden the old conception of usability as 'ease of use', 'ease-of-learning' and 'task fit'. For example, many of the things we do in the home have no underlying task goal, we just do them for the experience they provide [13]. Neither is there the same level of agreement and encapsulation of the large body of research knowledge that exists on how we should use technology for communication and co-operation. Lots to do then, there is another world out there for us to change.

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Profile Stuart Card

Stuart Card is a Research Fellow and the manager of the User Interface Research group at the Palo Alto Research Center (PARC) in California. He received his A.B. in Physics from Oberlin College, where he worked for a year as Director of the Oberlin College Computer Center. He left for graduate school at Carnegie Mellon University in order to study with Herbert Simon and Allen Newell in an interdisciplinary program in psychology, artificial intelligence, and computer science, culminating in a PhD in Psychology. In 1974, he came to PARC to work with Allen Newell and Tom Moran on a project to build a practical supporting science for human computer interaction. His study of input devices led to the Fitts' Law characterization of the mouse and was a major factor leading to the mouse's commercial introduction by Xerox. His group developed other theoretical characterizations of human–machine interaction, including the Model Human Processor, the GOMS theory of user interaction, Information Foraging Theory, and statistical descriptions of Internet use. The group put these theories to use in new paradigms of human–machine interaction including the Rooms workspace manager, the Web Forager Internet browser, papertronic systems, information visualizations, and contextual computing. The work has resulted in a dozen Xerox products as well as the founding of three software companies.

Card is a co-author of the book *The Psychology of Human–Computer Interaction*, a co-editor of the book, *Human Performance Models for Computer-Aided Engineering*, and has served on many editorial boards and government committees. He has also been an adjunct faculty member at Stanford University. His most recent book, *Readings in Information Visualization*, co-written and edited with Jock Mackinlay and Ben Shneiderman, was published in 1999. Card is an ACM Fellow, a member of the ACM CHI Academy for human–computer interaction, and the first recipient of the CHI Achievement Award.

What is your idea of happiness?
To discover something really new in the morning and to go drinking with my friends in the evening.

What is your greatest fear?
It's time to go drinking, and I haven't discovered anything yet.

With which historical figure do you most identify?
Louis Pasteur

Which living person do you most admire?
Larry Waters, the man who attached balloons to an aluminum lawn chair and went up 16,000 feet high to the astonishment of two airline pilots flying by. I always wanted to do that.

What is the trait you most deplore in yourself?
I don't like to go to bed on time.

What is the trait you most deplore in others?
Lack of humour.

What vehicles do you own?
A Jeep. I've mostly owned Peugeots. Too bad they closed the dealerships. Greatest car ever was my Fiat 124. Too bad they rust.

What is your greatest extravagance?
Books. They're ruinous.

What makes you feel most depressed?
International affairs.

What objects do you always carry with you?
An HP-48GX reverse polish calculator and 8 MB RAM on my keychain.

What do you most dislike about your appearance?
I seem to be getting older instead of younger.

What is your most unappealing habit?
My dog.

What is your favourite smell?
Fresh mown hay.

What is your favourite word?
Perchance, bestir, theurgy, autochthonous.

What is your favourite building?
Hoover Dam. The combination of art deco and mass scale amazes.

What is your favourite journey?
Sailing the QE2 as a transatlantic oceanliner.

What or who is the greatest love of your life?
My trophy wife JJ and my ironic daughters Gwyneth and Tiffany. The dog is on probation.

Which living person do you most despise?
I can't tell you. Although he's from Texas, he might read this.

On what occasions do you lie?
When I need to sleep.

Which words or phrases do you over-use?
Quad erat demonstrandum. Ceteris paribus.

What is your greatest regret?
That my father died when I was young.

When and where were you happiest?
Walking down the street of the village where I grew up. I liked the tall elms, the old houses, and knowing everybody's business.

How do you relax?
Watch movies. Tinker with things. Read books selected by my daughters or members of my official reading panel.

What single thing would improve the quality of your life?
More time.

Which talent would you most like to have?
To be a great singer. Runner up: to be able to play the harpsichord in a Bach double concerto.

What would your motto be?
Carpe Diem.

What keeps you awake at night?
Nuclear proliferation.

How would you like to die?
In California, this is optional.

How would you like to be remembered?
Either for the thing I discovered in the morning or the friends I drank with in the evening.

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