

Interfaces

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British
HCI
Group
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Your pull-out-and-keep HCI2004 conference programme!

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View from the Chair

He eats, he shoots, he leaves

Sometimes we get so bogged down in the detail that we lose the bigger picture. In my case the last few months have seen a lot of planning for HCI2004 in Leeds and, already, HCI2005, as well as the HCI Educators workshop and follow-up panel at Leeds. Just occasionally comes the chance to stand back from it all and see the big picture. Like all the best Edinburgh construction sites, you can see progress, though not as much or as fast as expected. Better rush a few things then! Need to hothouse those fragile shoots, mulch them! If they don't get more established soon, then some big panda will eat them and vamoose!

Keeping the sense of the bigger picture makes sure that all our work leads somewhere, even if this means that flaws creep in because of compromise and higher priorities. Strangely, no matter how undesirable these flaws, somehow people still cope – they adapt to imperfections if there's enough payback. So ... does that mean I should stop checking for pedantic detail like dodgy apostrophes and other proof-readers' sins?

Well, no! The production editor's ire at such flaws is wholly justifiable on your behalf. Enough of you would get distracted, irritated, annoyed by sloppy writing, as to lead to you detaching from what is written, and the system, that is, this magazine, would decay. The HCI professional has to act on behalf of the user, attend to the detail that matters and gloss over that which doesn't, in the interests of keeping the big picture coherent. Knowing when you can break the rules is the hallmark of expertise.

After five years doing communications things for BHCIG, I now pass this column on to Andy Dearden, who takes over as Comms Chair this summer, while I start to give my undivided marginal attention to HCI2005. I bet he gets the same solid support I've had – Laura and Fiona and the other contributors to *Interfaces*, Sue Tueton et al at BCS, Ann and Nico and the rest of the UsabilityNews team, Vaz and Greg who each single-handedly manage bits of our electronic empire, David Gardiner at Vantage and Dave Clarke at Visualise who bring professional polish to conference publicity, and the many, many others who have contributed what and when they can to help us 'ensure information technology serves people'. Together we've built fledgling systems in the last few years, perennials that are well on the way to establishing themselves. With your help and involvement we can create a real answer garden to make 'failed IT projects' the exception and not the rule.

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Editorial

Welcome to *Interfaces* 60 and, if you're reading this in Leeds between 6th and 10th September, welcome to HCI2004! In honour of this being our 60th issue (and also because we received many more contributions than would fit within our usual 28 pages), we have a bumper issue for you, which includes a four-page pull-out HCI2004 conference programme in the centre pages.

You may or may not be aware that I edit *Interfaces* contributions using open source software, namely OpenOffice.org Writer word processor, Thunderbird e-mail client, The GIMP graphics package, Firefox web browser, all on a Linux desktop computer. Whether or not that last sentence meant anything to you, take a look at Calum Benson's article, 'The challenge of open source software usability'. Calum introduces the concept of open source software (OSS) and the issues involved in injecting user-centred design into the OSS development model.

David Mackay writes about his own OSS project, Dasher. Dasher is a novel method of text-input that allows the user to enter text using a mouse, a touchscreen, a PDA stylus, an eyetracker, or a head-tracker.

Finally, welcome to new columnist Robert St. Amant of North Carolina State University who writes about the examples of good and bad usability that he uses when teaching HCI and design to his students. And thank you to everyone who responded to Martha's call for 'My PhD' articles and my call for CHI2004 reports. We received several

of both. As a result, we have a good collection of perspectives on CHI2004 and two 'My PhD' columns this issue, with more of the latter next issue.

So happy reading and (if you're lucky enough to go) enjoy HCI2004!

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RIGHT TO REPLY

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

To receive your own copy of *Interfaces*, join the British HCI Group by filling in the form on page 31 and sending it to the address given.

NEXT ISSUE

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

with thanks to commissioning editors:

Book Reviews: Sandra Cairncross, s.cairncross@napier.ac.uk

My PhD: Martha Hause, m.l.hause@open.ac.uk

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Profile: Alan Dix

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top (right); Leeds Metropolitan University all other cover images and p3:

David Mackay p8; Linda Little supplied p13; Adam Cox p19, 21 (right);

Marcin Wichary & students from Tu/e course, Eindhoven p20, 21 (left).

Deadline for issue 61 is **15 October 2004**. Deadline for issue 62 is **15 January 2005**. 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.

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PDFs of *Interfaces* issues 35–59 can be found on the B-HCI-G web site, www.bcs-hci.org.uk/interfaces.html



Deflections

Donations most gratefully received – beyond luck and magic

Gilbert Cockton

There is too much magic in much of what can pass as HCI. I always think of chairs (apologies to those weary with Cockton's Chair) when I hear talk of immanent properties – feature magic, guideline magic, principle magic, pattern magic – where quality somehow resides entirely in the artefact and not in interaction. Chairology is a commonsense alternative to a full critique of Plato's idealism. There's no more quality in an interactive system than there is strength in a chair. A chair is strong until the wrong thing sits on it, and then it breaks. An idealist philosopher would have to conclude that the strength runs away just before a chair is crushed. An relational view is more persuasive: no chair is inherently strong. Rather, most chairs are just lucky with what sits down on them.

Similarly, guidelines, features, principles and patterns are at best lucky; i.e., as with chairs, they hold up when they are not overstressed. With chairs, luck is due to favourable Newtonian mechanics (fire, corrosion and other dangerous things apart). Forces within chairs are enough to hold the forces outside at bay. With interface magic (the collective noun for intrinsic quality rules in HCI), luck is due to favourable contexts of use that let cognitive universals determine interactive outcomes. Thus Recognition not Recall generally works because the former is always cognitively easier than the latter (if not then something must not be recognisable). However, this guideline breaks down when entering one's name on the web. A menu of the world's countries (Wake Island included) is bad enough when ordering on-line, but a menu of the world's population would be unusable! In this case, although I know the United Kingdom when I eventually see it, I may never get to see my name to recognise it. Recognition rather than recall fails when browsing costs outweigh recall costs.

As with supposedly strong chairs, apparent interface magic is due to luck, but interactive systems are far less lucky than chairs. Most chairs have a long and fulfilling life without ever suffering a crushing load. At worst, they rot in the rain outside second-hand shops. Interface magic, however, suffers crushing blows on a regular basis. Its luck runs out all too easily in the face of diverse and demanding contexts of use.

One size never has and never will fit all

We must renounce once and for all guidelines, principles and patterns that take little or no heed of contexts of use. We must rebut any HCI wit who offers design guidelines (or principles or patterns) on the basis of experience, unless their cool features really are robust across highly diverse usage contexts – even when we know audiences and scenarios; these are rarely tight enough to allow a feature to always work well for everyone.

Quality resides in interaction, not in artefacts

Interactive systems design impacts quality in two distinct ways. Given a specific usage context, it may improve or degrade quality in use. Secondly, it may degrade or improve fitness for purpose (and achieved quality in use is always

relative to this; there's little one can do to improve what isn't or shouldn't be there). Consequently, the value intended for interactive products or services may be destroyed, degraded, or delivered; in some cases, excellent design results in extra unintended value being donated. Alternatively, a sound understanding of HCI can deny intended value; i.e., there is no way that a design can deliver intended value for an intended context of use (as in Project Ernestine*). Here, HCI experts aim to stop (or at least inject realism into) a design, rather than improve it. Indeed, there simply may be no way to deliver on this week's latest technological utopianism, be that shopping agents, robot soldiers, electronic patient records or intelligent tutoring.

HCI and successful design

The relationship between design and outcome thus occupies two spaces. In the red space of signals passed at danger, HCI knowledge denies the possibility of successful design. In the amber space, design can proceed with caution: outcomes will depend on quality in use and fit to context, which have an impact on achieved product value that ranges from destruction (as in boo.com's collision with reality), through degradation and delivery to donation (and the consequential delight when outcomes and experience are surprisingly better than expected).

The 5 D's of HCI – deny, destroy, degrade, deliver, and donate – must replace the luck of interface magic. Quality resides in interaction, and is ultimately determined by value achieved in the world, long after an application is quit and a computer is shut down. I can't totally blame Word for the quality of my Autumn column, nor can Word take much credit if it's well received. At best, Word let me deliver. It didn't destroy or degrade my words. If only Microsoft had donated some features that would let me delight the reader! Let no-one deny that that is possible!

* Gray, W. D., John, B. E., & M. E. Atwood (1993). Project Ernestine: Validating GOMS for predicting and explaining real-world task performance. *Human Computer Interaction*, 8(3), 237–309.

Gilbert Cockton

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Cfp: A study of mobile learning as part of everyday learning

A number of questions regarding the phenomenon of mobile learning are being investigated as part of the MOBLEARN project undertaken by the Universities of Birmingham and Nottingham.

We are using a diary based study of everyday learning episodes and are looking for participants.

To take part, you will have to keep a diary of your learning episodes for two weeks, using either a paper-based diary, or an electronic one.

For more information:

<http://www.eee.bham.ac.uk/vavoula/LearningStudies/index.htm>

Ferraris and Fiestas

Russell Beale

In web-based surveys, there are often boxes to tick indicating your age range: under 20, 20–29, 30–39, over 40, and so on. It seems to me that you could easily replace those choices with something far more meaningful. Which radio station do you listen to?

- Radio 1 (under 20)
- Radio 2 (over 40)
- Radio 3 (quiet intellectual, not many of them about)
- Radio 4 (30+).

I never used to listen to Radio 4. All talk, no music. But it's now caught up with me, and I hear it most days. I have a theory about Radio 4. Give any programme on it two minutes of your time, and you'll be interested in it. Even the weirdest topics, things in which you thought you had no interest, and when the first 30 seconds seems to confirm this for you ("today, on *Gardener's Question Time...*"), if you continue to listen for the two minutes, you'll be hooked ("...and this tip will even keep elephants from eating your tomatoes.").

All this is by way of a slightly rambling introduction to the fact that, earlier this month, Radio 4 had a debate about the demerits of committees – they take lots of time, they abdicate responsibility, and, most interestingly, they provide strong social pressure to conform. This, it was argued, stifles creativity. Whilst disputed by the other party (always good for radio), there is certainly some truth in this, and it touches on some of the bigger issues that are interesting the HCI community at large at the moment, relating to design, creativity and users.

Consider the design of cars. Ferraris are passionate, sexy, fast cars, crafted through a single design ethos. Fiestas are functional, practical cars crafted by committees and focus groups. Both have their adherents: to pose in, the Ferrari wins; to go down the shops, the Fiesta. To use in general? It depends, but I know which I'd choose.

But with software, we always tend to advocate designing it by committee (user-centred design, it's called, but it has the effect of knocking off the rough edges). Gather users together, form the team, relate to the project, bond with the concepts, try out prototypes, and feedback to the designers; no blame culture allowed (and in some situations, feel the mystic power of the GUI flow through your fingers, transforming you into a point at the centre of our cosmos – well, you understand the concept, even if not all go that far).

But should we be aiming to produce consensus? Can we not move on from this, into a place where we can create workable software, but can choose to have passionate, quirky, fantastically stylish designs to make our user experiences much more enjoyable (even if they are slightly less practical)? Apple appear to be trying to take this stylish software approach: OS X is certainly quirky, pretty cool, and mainly usable. To an extent, some of XP is like that too – though with the iPod, neat design is matched by clever interaction to provide another great user experience – and reviews and revenues reflect this.

After all, we gain enjoyment from really cool, neat, clever, nifty, quirky ways of doing things. The problem is that (i) we (well, the software engineers anyway) are not always able to provide workable software in the first place, and (ii) what is cool and quirky for me is, perhaps of necessity, not cool and quirky for you. But I think that, as consumers, we should support good design, neat user experiences, that special something that certain things have which give you a warm fuzzy glow when you're sat in front of your screen. I want to be in a world that values Ferraris as much as it values Fiestas.

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Election to the CHI Academy



In April 2004 Prof. Brian Shackel received the announcement that he had been elected to the CHI Academy. Unfortunately he was unable, because of attending to his wife's illness, to be present at the award ceremony at the CHI Conference in Vienna. Therefore the other British CHI Academician this year, Dr. William Newman, kindly brought back the award plaque and presented it to Brian in Quorn on 14 May.

Election to the CHI Academy could be regarded, in effect, as a sort of honorary doctorate from SIGCHI, the Special Interest Group on Computer & Human Interaction (membership about 4,000 in North America and round the world) of the US Association for Computing Machinery (membership about 70,000). For more information, see <http://sigchi.org/documents/awards/>



SMS text messaging in the Malaysian general election

Haliyana Khalid

It is a humid evening in Kuala Lumpur, Malaysia, on 15th March 2004. There are just six days until the 11th general election of the country. Everywhere hundreds of posters hang from walls, between lights, and even on cars. In one corner of the restaurant, a group of men aged between 45 and 50 are waiting for their food and talking. A message tune on the mobile phone of one of them attracts the others. He has received an SMS text message reminding him of the polling date and persuading him to vote for the National Front Coalition. Looking motivated, he forwards the message to all his colleagues in the group. Then the beeping sounds can be heard again.

This is one example of the SMS text messaging phenomenon in the recent general election in Malaysia. Malaysians were besieged with political texts every day. Thousands of text messages were sent daily, from political parties, or forwarded by friends. For example, at the headquarters of United Malays National Organisation (UMNO), the leading party in Malaysian Prime Minister Abdullah Badawi's National Front Coalition, 50,000 text messages were sent daily.

I observed that, on receiving a text message, people respond in one of the following ways:

- Read and forward the message
- Read and show the text message to friends
- Read and delete the text message
- Delete the message immediately without reading it

Sharing

During the election, text messages came from many sources: for example, the political parties, media, friends, family. Mahyuddin Ahmad, an investment analyst from National Investment Corporation, subscribed to the Malaysiakini SMS Election Mobile Service offered by malaysiakini.com, an independent online newspaper. He received round-the-clock election news updates. Whenever he received a text message from the service, he forwarded it to his friends and family. Syarqawy Hamzah, a lecturer at the International Islamic University Malaysia, was one of the recipients.

What motivated them to share the text messages with others?

Having an interest in politics seemed to be one of the reasons that prompted them to forward the messages to others. Also, some people felt that they should help their party to woo voters by forwarding the messages.

Users' reactions depended on the content as well. Political text came in different types: for example, promotional, jokes, advice, and rumours.

"Vote for the PM who says work with me and we will work for you", read one message. "This election is not an experiment. Don't put your future at stake", said another.

People would laugh when they read political jokes, were sad when they received a text message telling them that their party had lost, and angry when they thought that the message was not true or was condemning their party. Mawar

Kamaruddin, a young business consultant in Deloitte Co., does not have any political stand and has no interest in politics. She usually deleted any political text messages that she received. But, when she received a political joke about one leader in Malaysia, she found it funny and forwarded to her friends. Mawar considered the message as a joke rather than as a political message. Most people tend to consider politics as a serious topic. Political jokes, by nature, are considered less serious and thus easily attract people's attention so they are motivated to share them with others.

Rumours

Some people forwarded or sent text messages containing rumours to provoke people and create trouble. For them, it was fun to see their rumours have a bad impact on their opponent's morale. Text message rumours did provoke people to create street demonstrations, illegal gatherings, and to cause chaos. For example, it was reported in the local media that minor scuffles broke out between police and opposition supporters in a northern part of Terengganu state on Monday night after crowds gathered outside two buildings following rumours that pro-government 'phantom' voters in Sunday's national elections were being brought there. Because of the negative impact it had on people's behaviour, a police chief in one Malaysian state threatened to arrest people who spread rumours via text message and to charge them with sedition or with threatening national security.

Did SMS text messages influence mobile users to vote?

It is very hard to know whether the text messages encouraged people to vote, although the number of registered voters did increase slightly this year. For users who had political stands, text messages probably did not influence their voting behaviour very much. In general, other external factors like family, friends, issues, and more negative factors like bribery, probably played larger roles in influencing who voted for whom. But as the number of mobile phone subscribers grows and the usage of SMS text messaging is high due to its relatively low costs compared with making calls, sending text messages is definitely the best way for a fast, easy, and more personalised campaign.

From my observations and interviews, text messages did seem to influence mobile users' behavior in general, both positively and negatively. It's hard to tell how much text messages swayed who people voted for, but one thing is for sure, they did successfully act as a psychological war agent on the Malaysian public. Being bombarded daily by these political text messages definitely helped to build awareness of the coming election. Incidents in a few Malaysian states and threats imposed by the police chief on text message rumour-mongers show how powerful electoral text messaging could be. But, perhaps, the parties that benefitted the most were the telecommunications providers who experienced a surge in their short messaging service business.

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Dasher

An efficient keyboard alternative

David MacKay

Keyboards are large, inefficient text-entry systems. They are inefficient for two reasons:

1. Keyboards do not take advantage of the predictability of normal writing. Whereas a choice of one key from a keyboard of 64 characters might convey 6 bits of information (since $2^6 = 64$), the information content of English is only about 1 bit per character. So keyboards are immediately inefficient by a factor of six.
2. Keyboards throw away the user's ability to make fine, continuous motor gestures. One finger, for example, is an analog device capable of generating many bits per second of precise pointing information; but a keyboard reduces the action of a finger to a single bit: up or down.

Dasher is an invention intended to rectify both these inefficiencies, by coupling a human's natural pointing

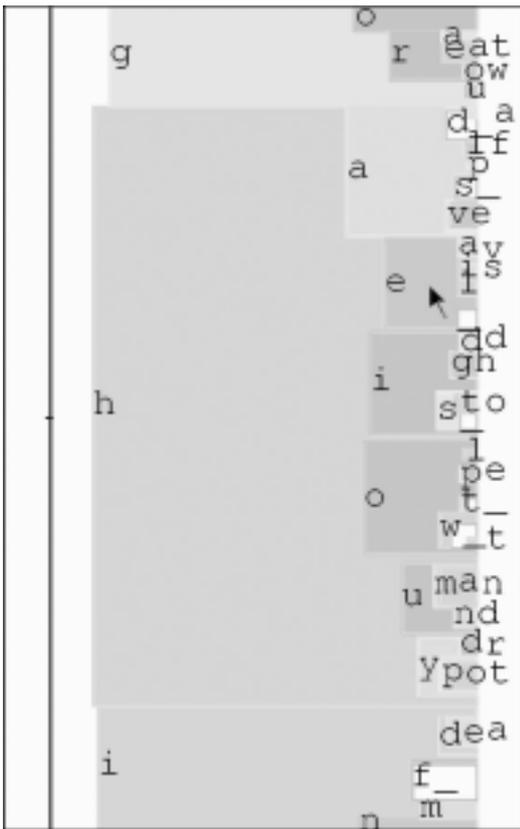


Figure 1 A screenshot of Dasher when the user starts writing 'hello'. The shelf of the alphabetical 'library' is displayed vertically. The space character, ' ', is included in the alphabet after z. Here, the user has zoomed in on the portion of the shelf containing messages beginning with g, h, and i. Following the letter h, the language model makes the letters a, e, i, o, u, and y easier to write by giving them more space. Common words such as had and have are visible.

The pointer's vertical coordinate controls the point that is zoomed in on, and its horizontal coordinate controls the rate of zooming; looking to the left makes the view zoom out, allowing the correction of recent errors.

capabilities directly to an interface that models the predictability of the text.

I had the idea for Dasher on the bus to Denver airport in 1997; Mike Lewicki and I were discussing: 'how could we make an efficient and human-friendly computer interface with an input device the size of one button?' and 'what about an interface that's driven by eye gaze alone?' I found a principled answer to these questions by borrowing a beautiful idea from information theory, called arithmetic coding (Witten et al., 1987), (MacKay, 2003, ch. 6). Arithmetic coding is an optimal method for text-compression using a language model. By turning arithmetic coding on its head, we obtain an optimal method for text-generation.

Dasher is a piece of software for text-entry, driven by continuous one- or two-dimensional gestures that are delivered, for example, using a mouse, touch screen, or eyetracker. The user writes by steering through a continuously expanding two-dimensional world containing alternative continuations of the text, arranged alphabetically. Dasher uses a language model to predict which letters might come next and makes those letters easier to write. The language model can be trained on example documents in almost any language, and adapts to the user's language as she writes. Dasher is free software.

How Dasher works

Imagine writing a piece of text by going into the library that contains *all possible books*, and finding the book that contains exactly that text. In this way, writing can be turned into a navigational task. What is written is determined by where the user goes. In Dasher's idealized library, the 'books' are arranged alphabetically on one enormous shelf. When the user points at a part of the shelf, the view zooms in continuously on that part of the shelf. To write a message that begins 'hello', one first steers towards the section of the shelf marked h, where all the books beginning with h are found. Within this section are sections for books beginning ha, hb, hc, etc; one enters the he section, then the hel section within it, and so forth.

To make the writing process efficient we use a language model, which predicts the probability of each letter occurring in a given context, to allocate the shelf-space for each letter of the alphabet, as illustrated in Figure 1. When the language model's predictions are accurate, many successive characters can be selected by a single gesture. With Dasher, it is easy to spell correctly and hard to make spelling mistakes.

Writing speeds with Dasher

The user steers using any convenient pointing system. The simplest is an ordinary mouse attached to an ordinary PC. Using a mouse, typical novice users reach a writing speed of 25 words per minute after 60 minutes of practice, and expert users can write at 35 words per minute (Ward et al., 2002). Dasher can also be driven more directly using a computer with a touchscreen; it works nicely on a Pocket PC. Dasher does not need great pointing precision.

For users who cannot point using a conventional mouse or



Figure 2 Dasher can be driven by eyetracker or by pointing on a touchscreen, as well as with a regular mouse.

touchscreen there are two ways in which Dasher can be used hands-free with a PC. The cheapest solution is a head mouse: a reflective dot is attached to the user's head (or whatever piece of anatomy they wish to move) and a small camera tracks the dot to control the mouse. For severely paralysed people, the direction of gaze can be tracked using an eyetracker. After 60 minutes' practice, novice users can drive Dasher using an eyetracker at a speed of about 15 words per minute; expert users can write at 25 words per minute (Ward and MacKay, 2002). Not only is this speed much faster than alternative hands-free systems such as on-screen keyboards, Dasher users make far fewer spelling mistakes. Furthermore, whereas staring at on-screen buttons is exhausting, navigating through the Dasher landscape is a natural activity for the eyes, comparable to driving a car.

Who is Dasher for?

It would be nice to create a new writing system superior in all ways to a keyboard, but ten-finger typists should not throw away their keyboards yet. Dasher is not as fast as ten-finger typing. But it is useful to a large community of users, both able-bodied and disabled.

Anyone who cannot use a regular keyboard will find Dasher useful – for example those who suffer from repetitive strain injury. Dasher can be driven using an ordinary mouse and does not require button-clicking. It can also be driven by numerous unconventional mice; we find the Smart-Nav head mouse is an especially versatile solution.

Dasher can also be used by severely disabled people. As I mentioned above, anyone with normal eyesight can use Dasher with an eyetracker to communicate at up to 25 words per minute. We are also developing a breath-controlled version of Dasher, with lung volume directly controlling the vertical coordinate of the mouse. In this situation, the user conveys only a one-dimensional pointing signal, whereas regular Dasher uses a second horizontal pointing dimension to control the speed of zooming-in or zooming-out. In a new one-dimensional-pointing version of Dasher, extreme pointing, up or down, causes the display to zoom out, and the intermediate range of pointing gestures give the normal

zooming-in behaviour. We find this one-dimensional version just as easy and fast to use as two-dimensional Dasher. For users who can only click *one button*, we are developing a version in which those single clicks switch Dasher from turning one way to turning the other way. And for users such as palsy sufferers for whom time-critical gestures are not an option, we are developing a two-button mode for Dasher, in which each step of Dasher's motion is initiated by pressing one button or the other.

Finally, Dasher is perfect for miniature computers (including mobile phones) and for tablet PCs that do not have full-size keyboards. Compared with handwriting-based systems, Dasher has a much smaller error rate. And compared with miniature on-screen keyboards, Dasher is faster (after a little practice) and requires less precise pointing by the user. If a palmtop computer had a tilt sensor in it, then Dasher, in its one-dimensional mode, could also be used one-handed.

Dasher's language model

The language model inside the current version of Dasher is embarrassingly crude. The model simply records the frequencies, in the training text, of all letters, all pairs of letters, all trigrams, and so forth, up to sextuplets, and merges these statistics to make predictions in any given context. So Dasher knows nothing of the concepts of words, dictionaries, or grammar. As Shannon established in 1948, most of the predictability of English is captured in its letter-level statistics. And Dasher certainly behaves as if it knows not only words but also whole phrases.

One advantage of this crude approach is that it allows a single piece of software to work instantly in multiple languages and multiple fonts. Dasher version 3 works in Albanian, Czech, Danish, Dutch, Finnish, French, German, Japanese (Hiragana), Hungarian, Italian, Korean, Norwegian, Polish, Portuguese, Russian, Spanish, Swedish and Welsh. To switch language, one simply loads up a training file containing natural text in the chosen language. And because the language model learns all the time, it can pick up the user's personal style and turns of phrase. A new language can be



added to Dasher's repertoire by editing an XML file that specifies the letters of the alphabet.

The future of the Dasher project

Is Dasher useful for language acquisition, for learning to spell, or for other educational purposes? Would a computer novice who's never used a keyboard find Dasher an easier input method? Formal studies have yet to be made. But informal evidence comes from a user in New Zealand, who describes the response of three children to Dasher:

While playing with Dasher was making me a little seasick, not so my 11 year old son. He's a computer wizz and was asking how to speed it up in no time. He's played every game imaginable, and written even more of his own, yet Dasher held his attention for several hours, days in a row. That's remarkable. Furthermore, we had a couple of kids here yesterday, at the opposite end of the spectrum: they have no home computer and few at their school (almost no access to them anyway). But they too took to Dasher and were fascinated. The three argued over spelling and sentence construction – and even got the dictionary out at one point to confirm/deny.

That's the long story; the short one is, while I can't pin down the exact appeal, I strongly suspect Dasher has a place in education as well as

special needs. In that region where those two meet, it could be a very potent educational tool.

Dasher was created by David MacKay and David Ward in the Physics department of the University of Cambridge. The project is supported by the Gatsby charitable foundation. Dasher currently works on PCs running Windows or GNU/Linux, on Mac OS X, and on Pocket PCs.

Most users find Dasher is quick to learn, just like a video game – 'attack of the killer alphabets', it's been called. We encourage you to try it out (it's free!) and send us your feedback. www.inference.phy.cam.ac.uk/dasher/

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David MacKay
University of Cambridge

Meeting the challenge of open source software usability

Calum Benson

We all know the theory: learn about your users, involve them in your design, work with developers to iron out any technical issues, and you should end up with something that pleases most of the people most of the time. But what if the developers are more intent on coding for themselves, in their spare time and for their own amusement?

That's the situation facing an increasing number of usability practitioners today, thanks to the rapidly growing popularity of open source software. This article introduces the open source ethos, considers the challenges of integrating user-centred design into its distributed, developer-centric practices... and will hopefully persuade some of you to join in the fun!

How does open source work?

Open source software (OSS) is so called¹ because its source code is freely available for anyone to read, modify, and distribute under the terms of an OSS licence, such as the GNU Public Licence² (GPL) [1]. Releasing software under the GPL entitles anybody else to distribute it for free, with unlimited modifications, under the same terms.

OSS software is typically developed by hackers³ downloading the code from a central project repository,

fixing bugs or adding features, and returning the peer-reviewed modifications to the repository. Each project has one or more maintainers, often its originators, whose role is to approve any such changes, and to make new releases of the software when they deem it sufficiently stable or featureful.

Communication between contributors mostly happens via Internet Relay Chat (IRC), mailing lists, comments in the project's bug database, and occasionally usenet newsgroups. Most decisions are made on one of these public forums; private email conversations are often viewed suspiciously. A working meritocracy is therefore quickly established, as the quality of everyone's contribution is highly visible.

Who uses it?

Once the realm of hobbyists and students, partly because of its roots in research and academia [2], several factors have been changing the way that OSS communities work:

- Proprietary software support costs have spiralled, and organisations are turning to the OSS world for alternatives. The US Department of Defense [3], the Chinese government [4], Allied Irish Bank

¹ The official definition of open source software is published by the Open Source Initiative at <http://www.opensource.org/docs/definition.php>. To avoid ritual humiliation when discussing open source software with developers, you should also familiarise yourself with the definition of free software, as published by the Free Software Foundation at <http://www.gnu.org/philosophy/free-sw.html>.

² The GPL is not the only OSS licence; others include the BSD and MIT licences, which differ in their redistribution terms. There are also open source licences for documentation, artwork and audio files.

³ Contrary to tabloid usage, hacker is merely the term for an enthusiastic or obsessive programmer, and very much a compliment in OSS circles. Someone who breaks into a computer system is more correctly known a cracker. (Source: The Jargon File v4.4.7: <http://www.catb.org/~esr/jargon/html/go01.html>)

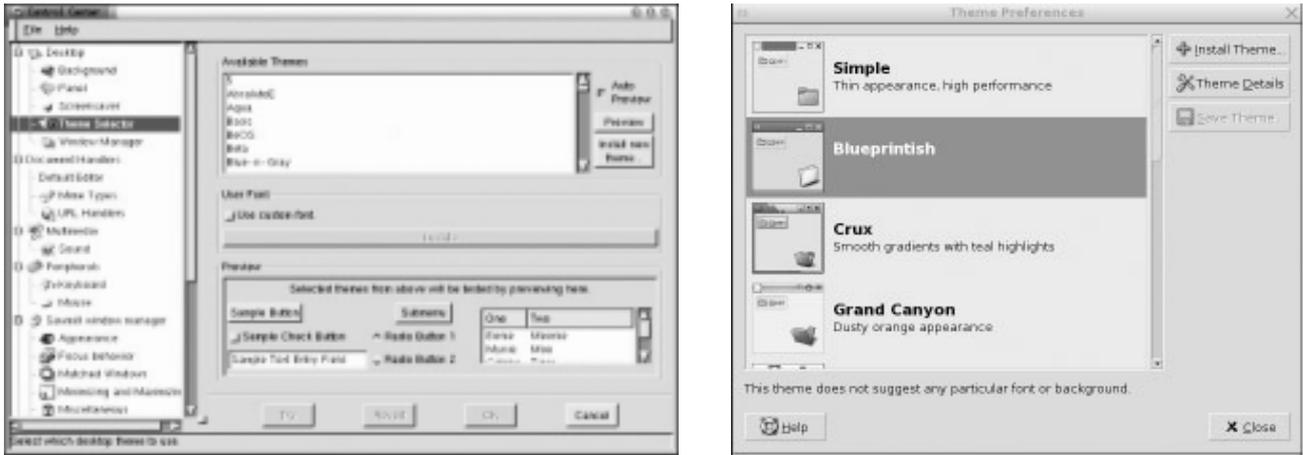


Figure 1 The dialog box that GNOME 1.4 users had to navigate to select a desktop theme (left), and the theme preferences dialog in recent versions of GNOME (right).

[5], and Munich City Council [6] are among those that have recently adopted OSS solutions. In response, software vendors such as HP, IBM, Novell, and Sun Microsystems have increased their contributions to OSS projects [7], with a positive effect on usability, QA, and documentation – the ‘boring stuff’ that hackers typically neglect.

- Developing countries are increasingly deploying OSS solutions. These are often translated into local languages that proprietary equivalents do not support, but that can be added to an OSS project by a few enthusiastic translators with a couple of weeks on their hands.
- With the first fully accessible OSS graphical desktop environments imminent [8], OSS screenreaders, magnifiers and on-screen keyboards are beginning to rival expensive commercial offerings. Partly due to the involvement of vendors selling to US government agencies, for whom Section 508 compliance [9] is necessary, compatibility with these assistive technologies is now a requirement of many OSS applications. This also improves their overall usability.

A case study: GNOME

In my usability role at Sun Microsystems, I’ve contributed to the GNOME project [10] for the past four years. GNOME is a complete graphical desktop environment for Unix-based systems, featuring familiar file manager, web, email, calendar, and instant messenger applications, multimedia capabilities, and other supporting utilities.

With GNOME, a couple of other things happened to make developers think more about usability. First was the advent of Eazel Inc., a startup founded in 1999 to develop OSS applications and related services [11]. Packed with ex-Apple talent such as Andy Hertzfeld, Mike Boich, and Bud Tribble, they crafted an elegant, Finder-like file manager for GNOME called Nautilus. Still a cornerstone of the GNOME desktop today, Nautilus outlasted Eazel itself, which folded two years later – but not without planting the notion that designing for ordinary people was cool, too.

Shortly after Nautilus became available, Sun conducted a usability study of GNOME 1.4 [12], presenting the results at

the annual European GNOME Users and Developers Conference (GUADDEC). This was the first time that most developers had been confronted with non-technical users’ reactions to their software. Despite some pockets of resistance to the idea of GNOME becoming ‘not just for hackers’, the effect was overwhelmingly positive.

A project usability team was subsequently formed. Its first task was to devise project UI guidelines [13], against which every GNOME application is now checked for conformance prior to each release. Any that needlessly deviate are given a couple of weeks to implement the team’s suggested improvements, or risk exclusion from the release. The team’s other influences include the introduction of a usability keyword for all usability-related bugs, making them easier to track; and the garnering of support for removing GNOME’s numerous, endlessly configurable features and preferences, to be replaced by sensible defaults instead.

As an example of the effect this had, compare the dialog that users had to negotiate to change their desktop theme before and after the usability team’s involvement (Figure 1).

Other OSS projects have had similar successes. KDE (similar to GNOME, but using different underlying technologies), Mozilla (web browser, mail and news reader, HTML editor, and instant messenger), and OpenOffice.org (MS Office-interoperable document, spreadsheet, presentation and drawing suite), for example, all now have dedicated usability teams [14, 15, 16] and have published UI specs, guidelines, or usability studies, to good effect (Figure 2). Third parties are also now conducting OSS usability studies [17, 18], which is particularly good news for projects with limited usability resources of their own.

What challenges remain?

A survey of OSS usability uncovers a number of recurring issues, many of which could benefit from the input of more, HCI-savvy contributors:

- Few projects yet meet the most basic usability requirement: a thorough understanding of their target audience. While some developers now feel they want to design for ‘the average Mac or Windows user’, they lack an appreciation of what that means, or when it’s the right thing to do.

Introducing persona-driven design could be beneficial here.

- Most large OSS projects have a usability team, but it usually lacks a clear charter. On GNOME, the team hoped to be a usability 'consultancy', but its main contribution has been commenting on bug reports, coordinating pre-release UI reviews, and updating guidelines. No community-driven OSS project's usability team is doing anything notably more effective, so ideas from new contributors are always welcome.⁴
- A UI review period could work equally well on other projects, but it needs to be extended across the development cycle. For its next release, the GNOME usability team will meet with maintainers at the start of the development cycle to discuss the features the maintainers want to add, and how best to do so with the user in mind. This approach is still somewhat developer-centric, but many maintainers are unpaid volunteers and will understandably focus on features that interest them. Dictating lists of requirements

merely invites the risk of non-cooperation in future.

- Usability bugs are more likely than ever to be treated equally to functionality bugs. However, resolving a seemingly simple usability issue can take weeks, months or even years, spanning bug reports, mailings lists, and IRC chats – sometimes simultaneously – which can deter even the keenest usability advocate [19].
- Hackers will generally (and sometimes religiously) only use OSS tools to develop OSS code, but few such tools exist to help developers design guideline-compliant applications. Potentially automatable tasks that usually have to be done manually include:
 - ♦ adjusting control spacings to match guidelines
 - ♦ spell-checking labels and messages
 - ♦ checking for missing or colliding mnemonics in menus and dialogs

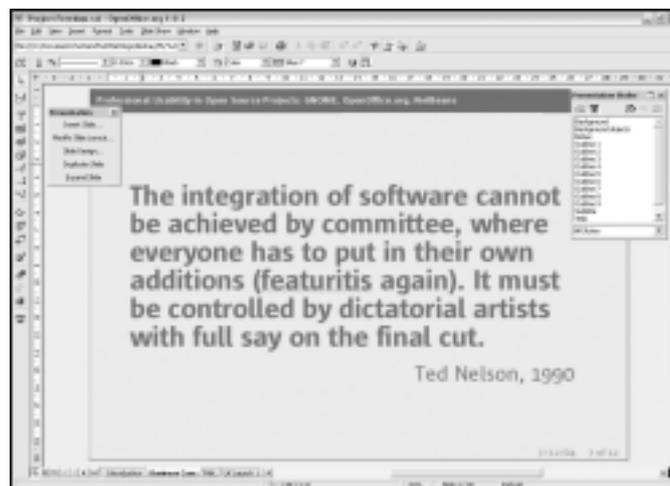


Figure 2 Four popular OSS applications (clockwise from top left): Mozilla web and email, OpenOffice.org productivity suite, GNOME desktop environment, and KDE desktop environment.



⁴ In contrast to company-driven OSS projects, such as OpenOffice.org, where the company's usability staff can continue to specify, design and test the majority of UI components in a more traditional fashion.



- Developers have a perception that usability studies need to last a couple of weeks and happen in usability labs. Teaching them techniques such as paper prototyping, which they could potentially employ themselves with local users, could help them think about usability before they start coding.
- It's difficult for users to know where to seek help or to comment on OSS applications; good feedback is probably being lost. Talking about the Mozilla project, Kamiyo Nakakoji [20] says:

Reports from lots of users is unusual too; my usual rule of thumb is that only 10% of users have any idea what newsgroups are (and most of them lurk >90% of the time), and that much less than 1% of even Mozilla users ever file a bug. That would mean we don't really ever hear from 90% of users, unless we make some effort to reach them.

One approach might be for larger projects to have a dedicated user support team to maintain FAQs, collate and respond to queries, and liaise with its usability team. Instrumenting pre-release software to have users perform their own usability assessment (following a test script built in to the software) and then send the results to the developers is another interesting possibility, embodied by the Uzilla project [21].

- There is little experience-sharing between different OSS usability teams. Some websites [22] and mailing lists [23] have sprung up to try and address this, but as yet they are few and far between, and short on content. Attempts have been made to merge the usability efforts of related OSS projects [24], but interest has quickly waned. Usability volunteers who were available to work on multiple projects could potentially make good inroads here.

Summary

Open source development is a dynamic and exciting area to work in. Whilst evangelising usability to developers is nothing new, OSS projects demand skills beyond those in a corporate setting – with every decision being made in public, you're answerable to thousands of your peers around the world within minutes, with no managerial backing to help you out! As a professional, helping to establish good usability practices in such an environment is both challenging and rewarding, and has potentially far-reaching implications for all of us if OSS adoption continues apace.

Usability students, you have your part to play in raising the bar too. Encourage your HCI tutors and lecturers to use OSS applications in class for assignments and case studies. Chances are there'll be a lot more for you to get your teeth into, and a greater possibility of any recommendations you make being incorporated into the actual product – which, in the case of applications like Mozilla or OpenOffice.org, could make life that little bit easier for millions of users worldwide. That's a pretty satisfying thing to do before you've even earned your first pay packet... so come on, join the open source revolution!

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CHI 2004

CHI inspiration!

Linda Little

The theme for CHI 2004 was *connect* and this year's crowd seemed to connect in many ways. Some colleagues and I found a very innovative way to 'connect'.

The majority of attendees at CHI probably had submissions rejected and therefore on registration only received the Conference Proceedings (on CD) in their 'biodegradable red bag' and no prestigious 'Presenter' ribbon to stick onto their nametag. Well, Andrew Patrick (NRC, Canada) and I were among the ribbon-less attendees. Over lunch the conversation turned to 'CHI ribbons' as several of our colleagues were wearing them and maybe we actually felt 'left out'. How could we, as 'rejected submitters', connect? The inspiration came from the 'red bag'! That evening, along with Liz Sillence, (who had a 'real ribbon') we sat and cut the ominous red bag into approximately 4cm x 8cm strips and duly labelled these 'PAPER REJECTED', thus inventing our own 'ribbons' to stick to our nametags. That night just happened to be the conference reception, a golden opportunity to wear and hand out our ribbons to other CHI rejectees!



It worked – we 'connected' – and had quite a lot of fun in the process!

So in the future, if your paper is rejected, don't mourn – latch on to the conference theme and think of an idea to connect with the majority of other people attending who are in the same position!

Linda Little
PACT Lab
Northumbria University, UK

First annual student design competition scores big!

Todd Zazelenchuk

In April 2004, in Vienna, Austria, the CHI conference hosted its first ever design competition for students from around the world enrolled in HCI, industrial design, and interaction design programs. The idea had been proposed 18 months earlier at the initial conference planning in January 2003, and there was much uncertainty as to how it might turn out. Would there be sufficient interest? What should the format of the competition be? What would be an appropriate design problem for students to consider? Although student design competitions had been held before by other conferences and by companies such as Apple Computer, the idea represented uncharted territory for the CHI community.

Given the timing and location of CHI 2004, and the proximity of both to the summer Olympics scheduled for Athens, Greece, a few short months later, the Olympic Games were chosen as the context for a problem that would hold both appeal and relevance to an international audience. The design problem asked students to address the controversial issue of judged events at the Olympic Games by researching, designing, and proposing concepts for an audience scoring system that would increase the spectators' level of engagement by allowing them to submit and view their scores for the diving and gymnastic events. Student teams comprising two to five multidisciplinary members were asked to submit a five-page design brief along with a large-scale poster illustrating their concept and design process. The full description of the problem and requirements is available online at: <http://www.chi2004.org/cfp/student.html>.

In total, 26 teams representing 16 schools and 9 countries submitted solutions to the competition. An international group of 25 HCI professionals independently reviewed the submissions and invited 19 teams to attend the conference in

Vienna. Once at CHI, the teams presented their posters to a group of three international judges who further reduced the field to eight teams who then gave formal presentations on their concepts. In the end, three teams were awarded Gold (Savannah College of Art and Design), Silver (Indiana University), and Bronze (Carnegie Mellon University) medals as winners of the competition.

In short, the competition was deemed a huge success by organisers, students, instructors, reviewers, and judges alike. The competition had succeeded in attracting many schools from multiple countries, and served to extend CHI beyond the popular HCI programmes to include the industrial and product design communities as well. The quality of the students' work was stellar, with many reviewers commenting on the high standard and how much they enjoyed the review process. Finally, the students themselves endorsed the event, fully recognising the value of the process and the experience for their future professional careers, and like any good designer, identifying opportunities to make it even better in the years to come. Perhaps the best indication that the competition was a success, however, is the fact that it is set to run again at CHI 2005 in Portland, Oregon, USA. Be sure to visit the details at <http://www.chi2005.org/cfp/student.html> and we look forward to seeing you there!

Todd Zazelenchuk, PhD,
Whirlpool Corporation



As a Student Volunteer at CHI, I found myself in the fortunate situation of being able to enjoy many aspects of the conference that I would probably not have had the time or inclination to enjoy if I had been involved as a presenter.

Along with attending tutorials, panels, workshops, trying to meet my favourite 'gurus' and all the sorts of things that conference attendees usually do (and of course fulfilling my duties as a SV, working my hours...), I decided to allow my 'agenda' some flexibility, and devote some time, now and then, to just wandering around and letting the conference come to me.

This is how I found myself at CHI Fringe. As many of you will know, CHI Fringe is a section of CHI devoted to the presentation of the more controversial papers that are submitted to the conference. It is an arena where authors discuss and get feedback on their work. But it is also a place where imaginative, stimulating, and often extravagant ideas are debated. And, last but not least, it's a fun place to be!

Novel approaches and perspectives on HCI were presented in rapid succession: robot dogs as artificial companions, prosodic analysis as an interaction technique, transparent video face-tops to support collaborative work in the office, online playing rooms that host a more natural and subtle communication exchange in poker games...the list of papers could be long. But I will only talk about two.

The first, McCarthy et al.'s '*The experience of enchantment in Human-Computer Interaction*' [1], looked at the interplay of intellect, senses, and emotions in people's experience with digital artefacts. The authors claimed that enchantment arises from ambiguity, paradox, unfinalisability, and openness. HCI is not just about generating tools that are user-friendly and that practically serve the purpose they were designed for; designing for the future also means creating stimulating experiences that help people connect with each other and with themselves in novel ways, experiences that do not see users as passive recipients of a product but rather as actively engaging in the shaping of the users' own encounters with tools, artefacts, and their functions.

Shaping enchanting experiences with technology means going beyond the mere functional aspect of digital artefacts and opening a space for users to playfully make sense of their encounter with these artefacts.

McCarthy et al. described a few cases of realisations of this novel approach to HCI in the field of jewellery. Eyelashes made from silver and stainless steel that, when worn, are too heavy to allow the wearer to open their eyes; rings that react to interaction between people and illuminate when touched. These are just two examples of artefacts designed to engage the users in theatrical, playful, enchanting experiences with objects and with other people. What these artefacts communicate is up to the people who engage with them: femininity, intimacy, concentration, sociability ... the character of the artefact is such that it is open to interpretations and resists definitive conclusions.

Another presentation that I had the pleasure to attend was Schiphorst and Andersen's '*Between bodies: using experience modelling to create gestural protocols for physiological data transfer*' [2]. Here the emphasis on playfulness, enchantment, and openness originated from a desire to investigate how technology can mediate social exchange and negotiation of

personal spaces. Schiphorst and Andersen described a project called *whisper* (wearable, handheld, intimate, sensory, physiological, expressive, response system), 'a real-time interactive public art piece, based on small wearable physiological sensors, micro-controllers, and wireless network transmission, embedded in evocative garments worn by the participants' [p.1].

By equipping participants with tools to monitor physical data patterns of the body, such as breath and heart rate, and to amplify them through visualisation and sonification techniques, *whisper* affords experiences of active and responsive social interaction, interconnection, and navigation of internal data. As with the piece of jewellery described by McCarthy et al., the wearable digital artefacts can be seen here as prosthetic devices that enable the user to communicate openness and to engage others in playful social interaction. The artefacts can represent an invitation to intimacy, a negotiation of privacy and access, permission and control, and co-operation in making sense of emotional and physical states.

The essence of both approaches to HCI is the belief that through the experience of enchantment, through evocation and openness of interpretation, users are involved in more personal and relational experiences with the self, with the artefacts, and with others.

Experiences with digital artefacts can immerse users in a magic circle, in a 'halo' of 'suspended disbelief' but this is not enough. If designers want to actively engage users at a personal, intellectual, emotional, and relational level, they need to create tools that support new interaction paradigms and that stimulate people to interpret situations for themselves, thus encouraging them, to establish meaningful personal relations with those tools.

What remains to be explored, I think, is how personal and relational experiences originate from the temporal and spatial context in which we use digital artefacts. The digital jewels and the physiological amplification sensor system described in the two papers have been considered as tools to encourage – or even urge – people to collaboratively make sense of them. But people do not interact with objects in a 'vacuum'.

How does the institutional space of the public art installation impact on the sense its participants make of it? How does the exhibition and use of a jewel change according to the institutional context in which the person wearing it finds himself?

How can the space layout in which interaction takes place be exploited as an artefact itself, to create the sense of openness and playfulness considered to be the premises for enchantment? And how does the association and combination of different artefacts and devices impinge on the meaning people will make of their functions?

The temporal and spatial sequences along which the interaction takes place necessarily influence the interaction itself, just as having had access to McCarthy et al's and to Schiphorst and Andersen's contributions at a particular stage of my research in the precise context of a leading international conference on a specific discipline influenced the questions they raised in my head. Not to mention having



HCI2004, Leeds Metropolitan University, 6–10 September 2004

Note: still subject to last minute changes.

Monday

9.00–12.30, 1.30–5.00

Tutorials

Effective and enjoyable research careers in HCI

H. Thimbleby

Systemic Task Analysis

D. Diaper

Evaluating interactive products for and with children

S. MacFarlane, J. Read, J. Hoysniemi and P. Markopoulos

Workshops

Designer, user, meaning maker: rethinking relationships for a more creative HCI

A. Chamberlain

Games and social networks: proposal for a workshop on multiplayer games

J. Halloran

HCI Educators Workshop

P. Englefield, R. Beale, L. MacKinnon, T. McEwan, B. McManus, J. Rosbottom

Doctoral Consortium

Design for design: graphical communication in computer-supported collaborative work in design

P. Mann

Searching the invisible web: an empirical study of users' interactive search behaviour in the opaque side of the web environment

Y. Mansourian

Interface design for adaptive, personal learning systems

E. Uruchrutu

Audio navigation: using spatial audio in ubiquitous interfaces to support physical navigation tasks

R. Day

Privacy architecture for intelligent environments

C. Chatfield

Supporting computer aided language learning with 3D navigation tools and techniques

Z. Gao

An investigation into improving test user selection

M. Hindmarch

Investigating the potential of mental models in adaptive user modelling

A. Adisen

Using speech recognition for child computer interaction when developing software for young children

A. Nicol

Design by dysfunction

R. Swinford

New ways to support web-based travel and tourism decisions

C. Lo

Supporting the social use of interactive television

J. Reeves

Tuesday

9.00–12.30, 1.30–5.00

Tutorials

Human factors for engineers

C. Sandom, R.S. Harvey

Improving usability in mobile interaction: a user-centered design perspective

L. Gorlenko, R. Merrick

Using Design Space Analysis to facilitate interaction design meetings

P. Englefield

A fast track to innovation: new methods for discovering applications and estimating user benefits

W. Newman

Workshops

HCI and the older population

J. Goodman

Empathy in human computer interaction

L. Hall

Designing for Attention

C. Roda

19:00–21:00

Conference Welcome & Informal Reception: Corn Exchange

Wednesday

9:30–10:00

HCI2004 Opening Ceremony

10:00–11:00

Industry Day Keynote: Kees Dorst

11:30–13:00 **Human Factors in the Wider Process.** Chair: Adrian Williamson

The Business of Interaction. Chair: Sally Fincher

Organising HCI. Chair: Paul Cairns

14:00–15:30 **A Vision for HCI.** Chair: Dave Roberts

Accessibility. Chair: Barbara McManus

Panel. Chair: Tom McEwan

16:00–17:30 **Context.** Chair: Shailey Minocha

Case Studies. Chair: Claire Paddison

Possible Industry Day Invited Speakers

British HCI Group AGM

17:30–18:30

19:00 – late

Conference Dinner: Salts Mill

Thursday

10:00–11:00

Keynote: Wendy Hall

11:30–13:00 **Interaction Behaviour.** Chair: Tom McEwan

Future Interaction. Chair: Mary Zajicek

Panel. Chair: Ann Light

14:30–16:00 **Searching, Searching, Searching.** Chair: Roy Ruddle

Collaboration in Work and Play. Chair: Nick Bryan-Kinns

Perspectives on Interaction. Chair: Peter Gardner

16:30–18:00 **Child's Play.** Chair: David Moore

Intimate Messages. Chair: Panos Markopoulos

Diversity in Design. Chair: Andrew Dearden

19:00–22:30

Reception, Buffet & Museum Tour: Thackray Medical Museum

Friday

9:30–11:00

Novel Interfaces. Chair: Ann Blandford

Evaluation. Chair: Marc Fabri

Panel. Chair: Janet Read

11:30–12:30

Closing Keynote: Thomas Erickson

12:30–13:00

HCI2004 Closing Ceremony and Handover to HCI2005



Wednesday

10.00–11.00

Keynote. Design: the new rules of the game

Venue: JG LTB

Kees Dorst

Kees Dorst was trained as an Industrial Design Engineer at Delft University of Technology, and studied some philosophy at the Erasmus University Rotterdam. Since obtaining his Master's degree in 1989 he has worked as a product designer for various design firms, participating in about fifty projects. At the same time he worked as a researcher in Design Studies at the TU Delft. In his thesis 'Describing Design? A Comparison of Paradigms' (1997, Cum Laude) he compared two fundamentally different ways of describing design processes: Rational Problem Solving and Reflective Practice. He has lectured at various universities and design schools throughout the world. Currently, Kees Dorst works as a Senior Researcher at the faculty of Industrial Design at Eindhoven University, and he is the editor for product design of the Dutch design journal ITEMS. He also teaches design methods at the Design Academy Eindhoven and at various management institutes in The Netherlands, and works as a consultant to the Dutch government, setting up an Institute for Postacademic Design Education. He has published numerous articles and four books. The address at the HCI conference will be partly based on his latest book, 'Understanding Design'.

11.30–13.00

Human Factors in the Wider Process

Venue: JG LTB

Chair: Adrian Williamson

Determination of usability requirements for a mobile application: a case study

T. Jokela, V. Tornberd

We present experiences on a teamwork based method for determining usability requirements to a mobile application, driven by the definition of usability from ISO 9241.

Human factors contribution to a safety case

E. Hey

An approach used by the human factors team to convince the customer that human errors had been sufficiently mitigated from occurring on the new Air Defence system's user interface.

AutoCAT study: an approach for assessing workload

D. Trepess, V. Jennings, A. Kilner, S. Paszkowicz

This presentation describes a simple human factors approach for assessing the impacts of new technology on workload. The approach is described in relation to automated video digitisation technology called AutoCAT.

The Business of Interaction

Venue: JG LTA

Chair: Sally Fincher

Designing for expert information finding strategies

B. Fields, S. Keith, A. Blandford

Observational study of digital library use shows that librarians possess simple, yet effective, searching strategies. Good interface design can aid non-experts in acquiring and using such effective approaches to searching.

Supporting user decisions in travel & tourism

A. Dearden, C.M. Lo

Reports on user behaviour in a simulated travel & tourism decision-making task. Results are related to previous literature and used to identify design considerations for future decision-support tools.

Histogram-based visualizations for large time-dependent datasets

J. Roberts, E. Lank, J. Gemmell

In this paper we describe the design of prototypes of histogram-based visualizations for browsing large, time-dependent collections of data.

A model of customers' behaviour with (B2C) e-commerce

S. Minocha, L. Dawson, N. Millard, D. Roberts

Describes a model of customers' purchase and consumption behaviour with e-commerce. This model provides a methodological framework to facilitate the erosion of conventional organisational barriers between IT and marketing professionals.

Organising HCI

Venue: JG LTE

Chair: Paul Cairns

Encouraging industry-academic research collaborations: lessons from the PACCIT programme

A. Anderson

The People at the Centre of Communication and Information Technologies Programme, funded by the ESRC, EPSRC and DTI, to encourage collaborative research between academics and industry. For information see: <http://www.paccit.gla.ac.uk>

The EnterAction Lab at the Fraunhofer Institute for Computer Graphics Rostock

C. Peter, H. Diener, J. Voskamp

We introduce the EnterAction Lab of the Fraunhofer-Institute for Computer Graphics Rostock. Activities performed in the lab concentrate on usability studies, affect detection and analysis, and new interface design concepts.

HCI and older and disabled people. Applied Computing, University of Dundee, Scotland

A. Newell, P. Gregor

Over thirty researchers are developing computer systems for older and disabled people. Interdisciplinary teams are developing new methodologies and also specific products for a range of specific application domains.

Teaching HCI: MISD at Napier University, Edinburgh

T. McEwan, S. Cairncross, P. Turner
After highlighting Napier's excellence in

HCI research and knowledge transfer in previous conferences, this year we focus on our learner-centred approach to teaching HCI and related subjects.

Interaction Design at Middlesex University: innovative human-centred solutions

W. Wong, P. Curzon

IDC researches: access and integration of future on-line public services and information; cognitive engineering of collaborative systems; digital library technology for specialist cultural collections; formalisms for predicting human error in interactive systems.

14.00–15.30

A Vision for HCI

Venue: JG LTB

Chair: Dave Roberts

Enabling users to create a clear visual hierarchy for a safety-related user interface

E. Hey, N. Mottershead

How the design team produced a solution that gave each user the freedom to create a personalised visual hierarchy for carrying out their tasks on the new Air Defence system.

Use case movies – films as sketches for interactive systems in user research

G. Blyth

Novel product concepts must be brought to life so stakeholders can fully understand and critique them. Our method converts UML use-cases into acted films, usable as stimuli in user research.

Fear and loathing in the living room: acceptability issues for interactive television services

L. Pemberton, M. Rice, R. Griffiths

We present preliminary findings from an observational and interview study of interactive television (iTV) users that confirm the usability and acceptability problems confronting potential users of this new technology.

Personas: complementing a user-centred design approach to developing e-commerce environments

L. Dawson, S. Minocha, N. Millard, F. Skinner

In cross disciplinary research in HCI and relationship marketing, we have derived empirically grounded customer-personas and templates of task scenarios of customers' interaction with e-commerce which will help guide the development team.

Accessibility

Venue: JG LTA

Chair:

A context-aware locomotion assistance device for the blind

C. Jacquet, Y. Bellik, Y. Bourda

We aim at designing a locomotion assistance device that delivers semantic information about its surrounding environment at any time. We study building structure modeling and present directions for user tracking.

The Disability Rights Commission formal investigation into website accessibility: implications for practitioners

H. Petrie, F. Hamilton

The Disability Rights Commission has completed a formal investigation into website accessibility for disabled people. This presentation outlines the investigation and its key findings, and discusses implications for web practitioners.

Beyond accessibility: comparing three web site usability test methods for people with impairments

Thea Van Der Geest

Three methods of usability evaluation (expert review, thinking-aloud and focus groups) were applied with users with various impairments, and their yield was compared. The methods proved not to be interchangeable.

An interaction analysis approach to accessibility

B. Cassidy, G. Cockton, L. Coventry

Presents a dialogue based modelling approach for predicting accessibility problems, noting improvements over existing approaches, and showing the importance of enabling states and user aspirations, using ATMs as an example.

HCI Educators Panel

Venue: JG LTE

D. Benyon, A. Dix, J. Earthy,

L. MacKinnon, T. McEwan,

H. Sharp

This panel is composed of employers of HCI graduates and authors of leading textbooks, and will examine the curriculum for university HCI programmes suggested by the Educators Workshop.

16.00–17.30

Context

Venue: JG LTB

Chair: Shailey Minocha

Context matters: evaluating interaction techniques with the CIS model

C. Appert, M. Beaudouin-Lafon, W. E. Mackay

We introduce the Complexity of Interaction Sequences model (CIS). CIS describes interaction techniques and predicts their performance according to their context of use. Predictions are validated with a controlled experiment.

Enhancing contextual analysis to support the design of development tools

C. Roast, A. Dearden, B. Khazaei

A key issue for innovative technology is how it can be integrated into its environment. Combining contextual studies and analytic methods provides a practical means of addressing this question.

GABBEH – a tool for computer supported collaboration in electronic paper prototyping

A. Naghsh, M. Ozcan

In this paper, we introduce a software system, GABBEH, to integrate pen-based electronic prototyping media within a framework of participatory design practice.



An object-oriented method for studying collaborative activities

M. Margaritis, N. Avouris, V. Komis
A method and tool is described, for studying interaction in the frame of synchronous collaborative problem-solving activities, with emphasis on the objects of the mediating space during collaboration.

Case Studies

Venue: JG LTA

Chair: Claire Paddison

Decentralized remote diagnostics: a study of diagnostics in the marine industry

J. Kuschel, F. Ljungberg

We present the results of a study of diagnostics work in the marine industry, with the purpose of exploring design implications for remote diagnostics.

The re-design of a PDA-based system for supporting people with Parkinson's disease

B. Göransson

This paper describes the re-design of a user interface and interaction, and how a practitioner can accomplish User-Centred Systems Design in the context of product development and consultant work.

Case study: conducting multi-user user tests in a collaborative environment

E. Hey

A case study on how the Human Factors team planned and conducted a unique user test that required many participants to work concurrently in a collaborative environment.

Invited Speakers Session

Venue: JG LTE

Yet to be confirmed

Thursday

9.30–10.30

Keynote. Interacting with the semantic web

Venue: JG LTB

Wendy Hall, University of Southampton

Wendy Hall is Professor of Computer Science at the University of Southampton, UK, and currently Head of the School of Electronics and Computer Science (ECS). She is the founding Head of the Intelligence, Agents, Multimedia (IAM) Research Group in ECS. She is the co-author of the book *Hypermedia and the Web: an Engineering Approach* (Wiley, 1999) and has published over 300 papers in areas such as hypermedia, multimedia, digital libraries, multi-agent systems and knowledge technologies. She is currently President of the British Computer Society and a member of several key committees including the Prime Minister's Council for Science and Technology, IW3C2 and UKCRC. She is a non-executive director of several companies and charitable trusts. She was awarded a CBE in 2000, and is a Fellow of the BCS, the IEE, the Royal Academy of Engineering and the City and Guilds of London Institute.

11.00–12.30

Interaction Behaviour

Venue: JG LTB

Chair: Tom McEwan

Comparing interaction in the real world and CAVE virtual environments

A. Sutcliffe, B. Gault, O. de Bruijn

Compares interaction in the real world and CAVE environments to investigate how user behaviour is altered by virtual environments and the causes of usability problems.

Evaluating usability and fun during initial and extended use of children's computer games

M. Bekker, W. Barendregt, S. Crombeen, M. Biesheuvel

This paper describes a study that examines the amount and kinds of usability and fun problems that can be found during initial and extended use of children's computer games.

In search of salience: a response-time and eye-movement analysis of bookmark recognition

A. Poole, L. Ball, P. Phillips

Investigates factors that influence bookmark salience, using response-time and eye-movement analysis. Demonstrates that the efficacy of bookmark recognition is dependent on an optimal combination of information quantity and information organisation.

Future Interaction

Venue: JG LTA

Chair: Mary Zajicek

An empirical comparison of one and two layer displays

W. Aboelsaadat, R. Balakrishnan

We present two controlled experiments that compare performance between one and two layer displays in users' perception of two potentially interfering virtual layers of information.

A critical analysis of synthesizer user interfaces for timbre

A. Seago, S. Holland, P. Mulholland

This paper analyses user interfaces of hardware and software music synthesizers, discusses problems with the user specification and modification of timbre, and identifies three principal UI types for controlling timbre.

Empirically derived guidelines for the presentation of concurrent earcons

D. McGookin, S. Brewster

This presentation outlines a set of empirically derived guidelines for the effective presentation of concurrent structured sounds called earcons.

Evaluating the viability of speech recognition for mobile text entry

A.L. Cox, A. Walton

This paper evaluates the viability of speech recognition for mobile text-entry. Results show that although more error prone than existing methods, speech improves text-input speed and is preferred by participants.

Evaluating a novel calculator interface

P. Cairns, S. Wali, H. Thimbleby

Existing calculator designs have real usability problems. We evaluate a new, radically different design. Despite years

of training with traditional designs, the new design performs comparably.

Panel: Values in HCI

Venue: JG LTE

A. Light, A. Blandford, G.

Cockton, A. Dearden, J. Finlay

Do common values unite researchers working in this discipline? If so, what are they? If not, how does this diversity support our practice and feed into the future of HCI?

13.30–15.00

Searching, Searching, Searching

Venue: JG LTB

Chair: Roy Ruddle

A first empirical study of direct combination in a ubiquitous environment

S. Holland

Direct Combination is a new, general, user interaction principle, able to reduce users' mental load and frustration, and to speed tasks, especially in ubiquitous environments. A preliminary evaluation is presented.

Supplemental navigation tools for web site navigation – a comparison of user expectations and current practice

C. Pilgrim, G. Lindgaard, Y. Leung, T. Yi

An empirical investigation into the expectations of users regarding the purpose and design of web site supplemental navigation tools establishing a relationship between information goals and navigation tool choice.

The geometry of web search

J. McCarthy, A. Sasse, J.

Riegelsberger

Introduces and validates the concept of a search geometry to describe eye behaviour with different tasks across multiple sites. The concept is contrasted with the notion of information scent.

Collaboration in Work and Play

Venue: JG LTA

Chair: Nick Bryan-Kinns

An evaluation of workspace awareness in collaborative, gesture-based diagramming tools

C.H. Damm, K.M. Hansen

Qualitative evaluations of a distributed collaboration tool suggest that using simple, non-intrusive awareness may result in fewer breakdowns, more symmetric collaboration patterns, better coordination, and higher perceived usability.

Towards the development of CSCW: an ethnographic approach

R. Iqbal, A. James

The theme of this paper is mainly methodological in investigating aspects of the relationship between the social organisation of work settings and the system development.

Understanding interaction in ubiquitous guerrilla performances in playful arenas

J. Sheridan, A. Dix, S. Lock, A. Bayliss

Drawing on theory from computing, performance and club culture, we illustrate how the use of intimate ubiquitous technologies in playful arenas has led to a new breed of guerrilla performance.

Perspectives on Interaction

Venue: JG LTE

Chair: Peter Gardner

Designing for social inclusion: computer mediation of trust relations between citizens and public service providers

A. Meehan, M. Grimsley

This paper advances a framework which supports HCI designers and managers in promoting ICT-mediated citizen engagement with public services through a strategy of trust promotion.

Supporting diverse HCI research

H. Thimbleby

HCI is diverse, exciting, and expanding. Inevitably the HCI community pulls itself in different directions, sometimes with the result that some worthwhile research is under-valued. This paper explores systemic issues and makes some constructive suggestions.

Design for life: ethics, empathy and experience

J. Knight

This paper considers experience design in terms of ethics and how an empathetic perspective and ethical framework informs the development of design tools and methods.

Three and a half decades of HCI: three brick walls and half a ladder

G. Cockton

Argues that a value-centred approach is needed to focus user testing and assessment of fit to context, and outlines and illustrates a value-centred framework for HCI with an e-commerce example.

eXtreme programming and User-Centred Design: friend or foe

H. Sharp, H. Robinson, J. Segal

We compare User-Centred Design and eXtreme Programming to consider whether they might form the basis of integration between HCI and software engineering methods.

15.30–17.00

Child's Play

Venue: JG LTB

Chair: David Moore

BMX bandits: the design of an educational computer game for disaffected youth

A. Waraich, G. Wilson

This paper describes the development and evaluation of a prototype multimedia Interactive Learning Environment that utilises a narrative centred design/development approach to develop a motivationally enhanced experience for disaffected youth.



Constructing a player-centred definition of fun for video games design

S. Boyd Davis, C. Carini

Good games are fun to play. In this research, we explore the concept of fun in video games and attempt to define fun through the player's experience.

The usability of handwriting recognition for writing in the primary classroom

J. Read, S. MacFarlane, M. Horton

An empirical study with children that evaluates the usability of the handwriting recognition for free writing.

Comparisons with keyboard input and pen and paper are made and design guidelines derived.

Intimate Messages

Venue: JG LTA

Chair: Panos Markopoulos

Mediating intimacy: digital kisses and cut and paste hugs

S. Howard, F. Vetere, M. Gibbs, J. Kjeldskov, S. Pedell, K. Mecoles, M. Bunyan, J. Murphy

In this paper, we explore what it means to understand and support the most personal of human acts – maintaining intimacy between family members.

Videotaped Activity Scenarios and the elicitation of social rules for public interactions

L. Little, P. Briggs, L. Coventry

This research demonstrates VASc can be used effectively to promote focused discussion around the topic of interest, in this case contextual factors that influence the use of public space technologies.

A home page is where the heart is: balancing pleasure and efficiency in knowledge management interfaces for contact centres.

N. Millard, P. Buckley, F. Skinner, R. Venousiou

This study shows how a combination of traditional and emotional usability principles can address issues of both usage and technology acceptance in the redesign of a contact centre knowledge system.

Instant messaging and privacy

S. Patil, A. Kobsa

Based on interviews with experienced users drawn from a variety of contexts, this paper presents findings about privacy in Instant Messaging (IM), and provides design guidelines for improving privacy management.

Affecteme, affectic, affection: measuring affective interaction with standard and affective systems

L. Axelrod, K. Hone

Measuring users' emotions during interaction is problematic. A practical methodology is suggested using Interaction Analysis techniques to identify discrete affective messages, 'affectemes' and their components. A pilot investigation is described.

Putting on a brave face with instant messaging

M. Fabri, D. Moore, D. Hobbs

Considers design and evaluation of Instant Messaging in virtual space. People are represented by 3D characters and express themselves via facial

expressions of emotion. How does it affect their experience?

Diversity in Design

Venue: JG LTE

Chair: Andrew Dearden

Tales, tours, tools, and troupes: a tiered research method to inform ubiquitous designs for the elderly

J. Lundell, M. Morris

Ubiquitous computing technologies present challenges in gathering requirements and testing prototypes. A case study shows a successful method in designing for the elderly using ethnographic techniques and focus troupes.

Doing ethnography and experiments together to explore collaborative photograph handling

T. Ormerod, N. Morley, J. Mariani, K. Lewis, G. Hitch, J. Mathrick, T. Rodden

Ethnography and experimentation are used to develop a collaborative photo browser. Post-hoc ethnographic analysis of interactions recorded during experiments yielded usability enhancements and unexpected interactions among couples handling photographs.

FearNot! Designing in the classroom

L. Hall, S. Woods, K. Dautenhahn, D. Wolke

A classroom-based method for obtaining design input from children is outlined and results from its use are presented. The design implications identified highlight the importance of including the child's perspective.

Misleading behaviour in interactive systems

J. Gow, H. Thimbleby, P. Cairns

Partial behaviour can mislead users, causing interaction problems. We show how they can be automatically identified and removed at an early stage, making them a useful concept for interaction design.

Computer algebra in user interface design analysis

H. Thimbleby

(Summary not available at time of publication.)

Friday

9.30–11.00

Novel Interfaces

Venue: JG LTB

Chair: Ann Blandford

User interface overloading, a novel approach for handheld device text input

J. Hudson, A. Dix, A. Parkes

User Interface Overloading is a novel approach for handheld text input and touch screen interaction. Our UIO model permits gesture activated layer interaction, which integrates seamlessly with common windowing systems.

Speed and accuracy in throwing models

M. Collomb, M. Hascoet

We propose a controlled user experiment to evaluate speed and accuracy of users performing moving objects tasks with

drag-and-drop and with our revised throwing model.

Haptic cues for supporting interaction design in the drawing domain

S. Sulaiman, A. Blandford

This paper presents a study which provides a systematic empirical account of haptic cues for drawing that has previously been lacking from implementation-oriented work in this domain.

Facial gesture interfaces for hands-free input

M. Lyons, G. de Silva, K. Kuwabara

We report two computer vision-based facial gesture interfaces (FGI) permitting hands-free interaction with a computer. Results of preliminary usability studies with these interfaces and examples of applications are described.

The modeller's apprentice – the toolglass metaphor in an immersive environment

F. Rioux, F. Rudzicz, M. Wozniowski

A gesture-based, bimanually controlled system is developed using the translucent toolglass widget metaphor for the purposes of 3D modelling in an immersive environment. Early discoveries and analysis are discussed.

Evaluation

Venue: JG LTA

Chair: Marc Fabri

Enhancing the readability of search result summaries

A. Aula

The efficiency of three textual result summary styles was studied. The experiment showed that the readability of textual result summaries can be significantly improved by simply re-organizing their layout.

Can more help be worse? The over-assisting interface

C. van Nimwegen, E. van Oostendorp, H. Schiff

The research investigates influences of greyed-out interface items on performance and knowledge. It had little influence on performance, but resulted in worse knowledge immediately after, and worse performance after delay.

Evaluating "human + advisory computer" system: a case study

A. Povyakalo, E. Alberdi, L. Strigini, P. Ayton

We studied the dependability of computer aided detection in breast screening. Statistical modelling and data analyses provided counter-intuitive insights into how computing support may affect human decisions.

Morphological analysis of HCI video data using activity theory

S.R. Harris

This paper describes methods for the analysis of video data based on activity theory, outlining techniques for the development of algorithmic & time-structure descriptions of activity during HCI task performance.

Timeline analysis: a tool for understanding the selection and rejection of health websites

E. Sillence, P. Briggs, L. Fishwick, P. Harris

This paper presents a timeline analysis as a way of helping to understand the decisions people make when searching

for health related information and advice online.

Falsification testing for usability inspection method assessment

A. Woolrych, G. Cockton, M. Hindmarch

Falsification testing is a method for accurately coding analyst predictions. There are claims that false positives cannot be accurately coded. Falsification testing shows these views to be mistaken.

Panel: Extreme HCI? – Designing for the differently able

Venue: JG LTE

J. Read, A. Newell, M. Zajicek, H. Petrie, A. Edwards

This panel explores common and distinct approaches to design for three extreme user groups; children, older people, and people with disabilities.

11.30–12.30

Venue: JG LTB

Keynote. Convivial systems: designing socially rich digital environments

Thomas Erickson, Social Computing Group, IBM T. J. Watson Research Center

Thomas Erickson practices interaction design and research at IBM's T. J. Watson Research Center in New York, to whence he telecommutes from his home in Minneapolis. His current work involves studying and designing systems for supporting computer mediated communication (CMC) in groups and organizations, and his principal aim is to create systems that can mesh with the social processes that govern our daily communication practices. Erickson's approach to systems design is shaped by methods developed in HCI, and theories and representational techniques drawn from architecture and urban design. His theoretical and analytical approaches are drawn primarily from rhetoric and sociology. In addition to CMC, research interests include virtual communities, pattern languages, genre theory and interaction design. Over the last two decades Erickson has published about fifty refereed papers, and has been involved in the design of over a dozen systems ranging from advanced research prototypes to commercial products). Prior to joining IBM Research in 1997, he spent nine years at Apple Research, five years at startup called Software Products International, and before that five years studying Cognitive Psychology at University California, San Diego. The potential for a shared theory is explored.

Details of Posters and Interactive Experiences presented at HCI2004 can be found on the British HCI Group web site, www.bcs-hci.org.uk

found myself in such a novel, relaxed, and fun situation as CHI Fringe.

These papers testify to how HCI communities can be influenced by literary and aesthetic insights, and how fruitful such influence can be in gaining new perspectives within the discipline.

References

[1] McCarthy, J., Wright, P., Wallace, J., and A. Dearden (2004). *The Experience of Enchantment in Human-Computer Interaction*.

[2] Schiphorst, T. and K. Andersen (2004). *Between Bodies: using Experience Modelling to Create Gestural Protocols for Physiological Data Transfer*.

Both papers are available to download from <http://www.chiplace.org/chifringe/2004/>

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On a field trip to CHI



When the MRes team at Lancaster were offered the chance to attend a conference this year, there was no question about which one we would prefer to go to. Our course centres on HCI principles, so where better to expand our knowledge than the leading HCI forum? We were extremely lucky that it was held in Europe this year, or else this would not have been possible.

For a small group of masters students from a modest North-West university, however, the 'connect' theme at CHI 2004 seemed a grand and unattainable goal. How were we, novices at our trade, supposed to mingle and contribute with world-leaders in the field of HCI? This humble feeling was compounded by the awe-inspiring setting of Imperial Vienna, which was the beautiful venue of this year's conference. However, upon arriving in the 'connectionary', or central meeting point of the conference centre, the atmosphere was friendly and welcoming, with many helpful student volunteers to assist daunted newcomers such as ourselves.

With barely a moment to look around, we were ushered straight into the opening plenary. Introductions came from the conference chairs, Elizabeth Dykstra-Erickson and Manfred Tscheligi, in a very American chat-show style, followed by a rather long awards ceremony. Just as most of our group were starting to feel very small and insignificant, not to mention tired, we were treated to an excellent lecture from Dr. Jun Rekimoto on the challenges and applications of new ubiquitous computing technology, which was enlightening, if somewhat overwhelming for students unused to 9am lectures.

After the plenary talk, newcomers were given the option of attending an 'orientation' talk. Those who went found it quite helpful, with advice being given on 'how to survive CHI'. Those who used the time instead to browse the exhibits in the connectionary or look at poster displays survived the

Lancaster University's MRes students

conference just as well. However, the orientation talk was very useful for explaining the difference between all the different styles of presentations available.

The main problem for newcomers, and indeed the biggest criticism of the whole conference, was that there was simply too much going on at once to be able to see it all. Naturally, everyone soon found their own strategies for dealing with this. While some chose to run madly from talk to talk trying to see as much as possible, a more popular answer soon proved to be that the group all went to their choice of session, and then met up during coffee breaks to compare notes and exchange information, working as a team in order to cover as many areas as possible.

CHI consisted of many different types of session, and everyone soon found a favourite. While not everything can be covered, and many are undeservedly omitted, some of our personal favourite sessions can be outlined here, along with some of our views on the different areas.

Tutorials and Workshops

Most of us had missed the tutorials and workshops due to the non-student-friendly cost of these. Those who did manage to attend a workshop said that they were worthwhile, if only for the networking opportunities, and felt that a tutorial would have been even more so, had it been more affordable.

Design Expos

Coming from an HCI course geared largely towards teaching practical skills in design, the design expos were a good opportunity to see how the skills we have acquired relate to those used in real industrial settings.

There were a total of three design expos throughout the conference. These covered design processes ranging from the redesign of the DisneyWorld.com website to encourage visitors to the holiday resort, to the creation of an Indic script keyboard allowing non-English speaking people in India the opportunity of using computers without the need for professional training.

The first design expo, 'Getting down to business', included two case studies: the development of the Palm Zire 71 PDA and the redesign of MSN9. The Palm Zire 71 presentation was a particularly good example of the development of a successful user interface and of the various constraints that are imposed on design. The 15 minute talk showed how external constraints can sometimes have a positive influence on product development, describing how restrictions arising from the PDA's hardware specification helped provide a



solution to a user interface problem – an interesting exception to the rule that form follows function.

As well as touching on technical limitation that can govern design decisions, the design expo also covered design techniques that inform design decisions. This included a novel design technique used by a team from Microsoft to develop MSN9.

To inform how the interface was to be designed, the team used a user-centred methodology, in which participants evaluated four mock-ups of possible designs of the MSN interface. Based on the personal opinions of the individual and the carefully structured group discussions, the technique gave informative feedback of good and bad points of each page. This innovative design strategy provided understanding of how MSN9's interface could be designed so that it would meet the needs of a broad range of users and also give informative feedback so that key decisions could be made about product visual design.

Overall the design expos provided us with an invaluable glimpse into the design processes used to develop a range of user-centred products and contrasted nicely with some of the more academically orientated presentations.

Short Talks

While there were far too many short talks to detail a representative number here, all members of the group attended some of them. It was very good to be able to skip between them, and sample a wide spectrum of topics, some excellent, some mediocre. To some people, it was these talks which really enabled us to 'get a feel for' HCI.

Posters

These included a poster competition in which students from many universities around the world presented innovative ideas in such areas as e-learning, affective user interfaces, usability, and user-centred design. These were definitely worth a look during spare moments of the day.

Papers

These were the 'meat' of the conference – sometimes these could be a little weighty, but usually very worthwhile due to the high standards of the event.

Some of the lighter ones included DiamondSpin (a toolkit for interactive tables), Gummi (a novel idea for a bendable computer), a study of usability issues in Massively Multiplayer Online Role-Playing Games, a study of the advantages of the 'Twiddler' chord keyboard over a standard mobile phone keypad, and a system that produced a way of labelling all the images on the Web – to aid searching and text-only browsers – through the use of computer games in which the players do all the work of associating text with the images.

SIGs

The special interest groups, or SIGs, were something we had not encountered before. At first, they seemed somewhat disorganised, but provided a rare opportunity to talk with people who would be presenting papers in a relaxed, informal setting.

Special Areas

There were also five 'special areas' covered during the week:

Ambient intelligence
European HCI Research
Games
Mobile Communications
Robotics and Transport

In the Robotics area, David Bruemmer demonstrated an impressive form of 'human-robot interaction' in which a small autonomous robot navigated its way around a series of obstacles via a series of (software-based) 'interactions' with a human operator, while NASA wowed the crowd with their futuristic Robonaut.

Within the European HCI Research session, Alan Dix presented an interesting paper on the theory behind European HCI research, focusing upon its development, and drawing comparisons with its USA counterpart, in what could be seen as a complex and challenging field.

The special interest on Games (What's My Method?) was structured like a game show and was, appropriately, fun to watch, if a little cheesy and contrived.

Fringe

The controversial CHI Fringe was very popular with some of our group, as it allowed some innovative and hard-to-publish work to be shown. As some of these works operated within an art/technology crossover, they provided a fascinating and visually stimulating look at how HCI can be used in some unusual ways. One example was that of a 3D video and immersive telepresence environment, pioneered by a research group from ETH Zurich and RWTH Aachen, Germany. This system, entitled 'blue-c', allowed a couple of users to interact with each other via a system of two virtual reality screens, a CAVE and 3D video. Within this, a user could see a 3D image, or avatar, of the other user on their screen and could interact with them by using body movement and/or gestures.

Demos



These were found to be better for people who preferred less theory and more practical demonstrations of how systems worked – or not, as the case may be.

Of these, the demonstration which seemed to receive the best reception from the audience was the Human Pacman system – a mixed-reality version of the classic 1980s game, involving real human participants becoming Pacman or a ghost, in a small maze built on stage. They were able to see the 'gum-drops' used in the game

through head-mounted displays, overlaid on their physical surroundings. The attraction of this demonstration seemed to be the sheer fun of the idea, and the playfulness with which it was carried out, which made a welcome change from some of the more serious, drier items.

The spirit of 'connection' gave the whole conference an interdisciplinary slant which was very welcome to all the

people of mixed backgrounds on our course. There was also a nice mixture of styles, from very technical at one extreme ranging towards others which were purely theoretical.

However, the organised sessions were only one side to the conference. The opportunity for networking was immense and extremely valuable, given the wide range of attendees present. The connectionary worked well as a central place for meeting people, relaxing and using laptops, although seating spaces were often limited. If any further incentive to mingle was necessary, free tea, coffee and cakes were on hand during scheduled breaks, which no student could ever fault. An interactive table also drew people together to play a variety of simple games in a very effective manner.

Some social events were also timetabled, including a reception held by the Mayor of Vienna at the Rathaus (town hall). A lavish affair, with a chance for all participants to gather informally in a stunning setting and 'connect', drawn together by a desire to interact freely with peers, as well as the shared attraction of more free food and drink.



During this time, our group was lucky enough to meet another group from Holland who were enrolled on a similar course to ours. This gave us the opportunity to swap stories, learn more about other approaches to HCI, and even build some new friendships. This was possibly the most effective 'connection' that was built during our time at CHI, and we feel that many other students could benefit from a similar experience, if some sort of an exchange scheme were to be established.

Another side to the networking aspect of the conference was the presence of many industry representatives, many of whom were looking to recruit. Stalls were present all around the edge of the connectionary for exhibits, and several companies held open-invitation receptions on an evening, including a cosy family-type affair with Human Factors, a staid semi-formal event with Microsoft, and a exuberant party with Google. At several points over the week, however, we were left kicking ourselves for not bringing business cards or CVs, as many companies asked for them. We also noticed that some companies would judge whether they were likely to be interested in a person by the company or organisation on their name-tags, which left us wishing we had had the opportunity to put a course name or description on them.

We were also very grateful to get the opportunity to explore the beautiful city of Vienna. Everyone agreed this was the perfect setting for such a high-profile event, with

amazing architecture, delicious food, and a clean, safe, friendly atmosphere which made it easy to connect with people outside the conference too.

At last, the closing plenary drew around, ending the conference with an excellent talk by Tim Brown on designing for experiences, using his wealth of design expertise from working in the field. The session was only slightly marred by the embarrassing rap performance which followed it, as an advertisement for next year's CHI. This did lead us to think, given the choice, would we attend next year? Most said yes, despite some disbelief that Portland, Oregon could be as splendid as majestic Vienna. We arrived as small people at a very big conference, and were made to feel welcome and part of the HCI community.

We saw a range of people in the field, from people we had heard of in studies, to people at our own level, which gave us confidence to believe that one day we too could write papers or give presentations. We made useful contacts and widened our sphere of awareness. We left full of knowledge (and cake), after a truly eye-opening experience. Everyone had found something there which was interesting and valuable to them, whether it was in the talks, the industry exhibits, or the social interactions. We had managed not just to avoid being swamped, but to take part, to find our own significance from the event, to become equals, and yes, even to connect'.



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Students on Lancaster University's Masters by Research in Design and Evaluation of Advanced Interactive Systems

With contributions from Louise Allen, Emma Jones, and all the rest of the MRes team.

The MRes cohort wishes to pass on their grateful thanks to the Departments of Psychology and Computing at Lancaster University and to the EPSRC, whose funding made this visit possible.

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Experiencing design

Waking up to HCI

Robert St. Amant

The digital clock radio by my bed has a row of buttons across the top. The first four are labeled in tiny raised print, from left to right, 'Snooze', 'Wake', 'Hour', and 'Minute'. These are ordinary buttons that can be pressed, indistinguishable from each other except for their position and label. The fifth button, on the far right, is actually a sliding button that allows me to choose one of several settings to control the radio and the alarm. This last button is shaped just like the others.

Let's consider a scenario that describes how someone might interact with my clock radio. In the evening, I set the alarm before I go to sleep. To do this, I push the 'Wake' button, and while I'm holding it down, I press the 'Hour' and 'Minute' buttons until I reach my wake-up time. I then push the sliding button to the 'Alarm on' position, and I'm done, at least until the next morning. When the alarm goes off, I can either press the 'Snooze' button to get a few more minutes of sleep, or change the sliding button setting to 'Off'.

Now for an equally important but less common scenario: I've just bought this radio, or perhaps there has been a power outage, and I'd like to set the time. To do this I simply press the 'Hour' and 'Minute' buttons and watch the numbers blink forward, in sequence, until the current time is reached. Now I'm done.

There are a few design issues worth pointing out.

First, the time-setting scenario is easier to carry out than the alarm-setting scenario: there are fewer buttons to press. In an effective design, the most common things that we do are the easiest to do, involving the fewest or easiest actions. After all, setting up a clock radio isn't something we do for fun. It's OK to make less common functions, such as setting the time, relatively less accessible (as long as none of the functionality is hard to get to in some absolute sense). The way my clock radio is designed, the opposite is the case.

Second, I've deliberately left out a few important factors from the first scenario that deal with my state of mind when I'm dealing with the clock radio. State of mind isn't always important, but it is here. How alert are you when you're awakened first thing in the morning by your alarm clock, compared with when you're getting ready for bed the night before?

I imagine that I'm like most people: if I go to bed at a reasonable hour, setting the alarm is trivially easy; in contrast, the next morning, when the alarm wakes me up, I'm much less alert. I reach out and feel around, often before I open my eyes, until I find the button that turns off the alarm.

Now remember that all the buttons look pretty much alike, and that you tell them apart either by remembering the order they're in or by reading the labels. Neither possibility can be taken for granted in this situation. Although I can usually manage to hit the correct button to turn off my alarm, occasionally I'll hit another button instead. These buttons just happen to be those that change the current time, either the hour or the minute. Ironically, correcting the time is one of the easiest procedures for this clock radio – fortunately for me, since I have to do this much more often than is really necessary.

How might we improve the usability of my clock radio?

We can't simply say, "Have the buttons that set the current time change the alarm instead, and vice versa." This would only exchange one problem for another; I will end up accidentally changing my wake-up time. There's also the issue of feedback: the existing design for setting the current time works (to the extent that it does) because whenever I press the 'Hour' or 'Minute' button, the visible time display tells me exactly what I've done.

There are more realistic solutions, of course. Other clock radios add more buttons, or add another setting to their sliding buttons, or merge the functions of some buttons (e.g., a single 'Change time' button that handles both hours and minutes) to allow more flexibility in what the remaining buttons do, or even simply move the more 'dangerous' buttons to a less accessible location. We could imagine redesigning my clock radio along these lines, though we would also have to imagine arguing with the hardware designers that any additional cost will be worthwhile to the customer in the end. (Most of us probably have a good idea about who usually wins this kind of argument, unfortunately, no matter how persuasive we are.)

It often happens that thinking about everyday objects and the way they work can give us insight into design issues for interactive software, as we see in the popularity among interface designers of books like Don Norman's *The Design of Everyday Things* (Basic Books, 1988). We have already raised several familiar ideas here. One is simple efficiency: the most common tasks should be easiest to carry out. Another idea is having protected functions, so that it becomes more difficult to carry out actions that have effects that may be undesirable or hard to reverse. The idea of reversibility, or error recovery, is unfortunately missing in action. The most important idea, though, is that trade-offs often dominate interaction design. These include hardware considerations, system performance, spatial constraints, and all the other factors that make designing interfaces difficult.

I teach a computer literacy class at North Carolina State University, and each semester I ask my students, who usually have backgrounds very different from computer science, to describe examples of poor design in their everyday lives. Over the years I've collected close to a thousand of these descriptions, of washing machines, elevator buttons, road signs, remote controls, and any number of other devices and environments. The exercise helps students realize that when a system, either software or mechanical, doesn't behave as expected, it's not always – in fact, not even most often – the fault of the user, but rather that the designer may have an incomplete or incorrect understanding of how their work will be used.

The students' examples have helped me realize that many common HCI concepts have analogues in the physical world, and that physical insights can help people better understand how software should (or should not) work. I'll introduce some of these examples in future articles.

Rob St. Amant

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My PhD

Filtering out inaccessible web pages

Alice Good

My academic background has traversed around the disciplines somewhat. From commencing with the so-called 'soft' sciences then hopping over to the more 'techie' side, I finally settling for something in-between – namely HCI. Whilst studying for a BSc in Computer Studies at Brighton University, it was the HCI related modules that provided a sanctuary from the anguish of networking and programming. I fervently believe that you have to think like a programmer in order to be successful in programming and I certainly don't fall into that category! After a blissful year at Sussex immersed in a Human Centred Technology Masters, I applied for a PhD at Portsmouth in information systems and computer applications and was accepted.

I'm now in my second year of my PhD. My research involves exploring means of improving web-page accessibility for disabled and elderly users. By disabled, I mean users who have an impairment that affects their ability to access web pages. For example, a wheelchair-bound person may not necessarily experience problems accessing web pages although someone with an 'invisible' disability, such as dyslexia, would do.

The laborious task of sifting through numerous web pages to locate required content can be tedious enough for the non-impaired user. Imagine if you had a cerebral palsy and relied upon software such as EZ keys, word prediction software that also enables alternative input, or indeed were a visually impaired person who used screen readers?

In considering that assistive/adaptive software relies heavily upon correctly coded pages, an alternative approach to adapting content was necessary. After exploring the idea of individualised support, I took inspiration from Adaptive Information Navigational Systems – i.e. providing an individual teaching pathway that supports user needs. These needs are stored in the system's user model.

Similarly, my approach involves adapting the order in which web pages are presented to the user according to how accessible they are to that particular user's needs. For example, a visually impaired user will not be able to use web pages that contain graphics without alternative text descriptions (Alt text). Such a user would be able to conduct a search with the proposed system and filter out inaccessible pages. Users have the option of two types of selection:

- Selection based upon user categorisation – if the user is mobility impaired, the system will look for elements such as small buttons or entry boxes

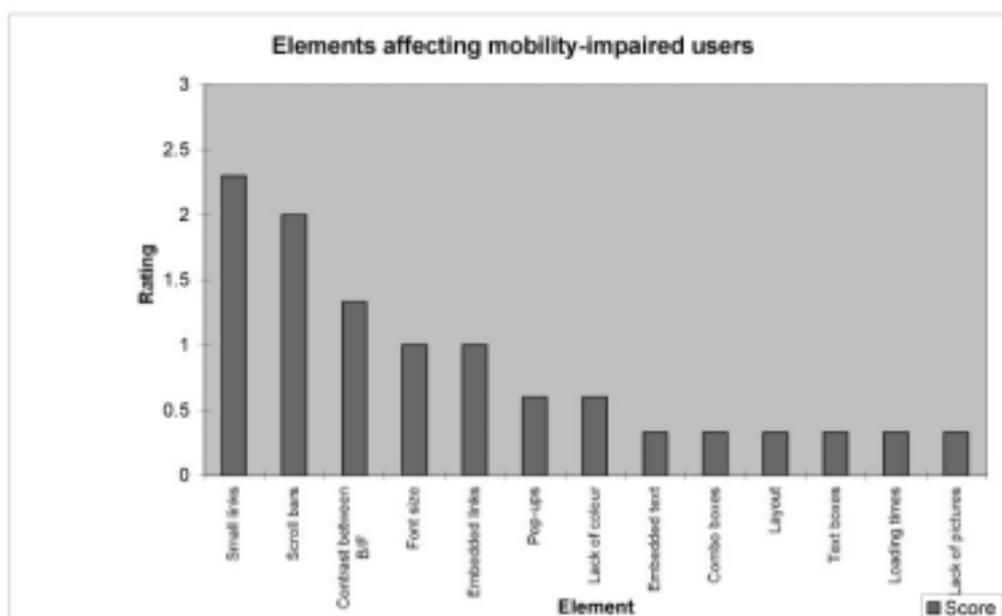


Figure 1 Elements affecting mobility impaired users.

that affect the accessibility of a web page for that particular user and filter these pages out.

- Individualised selection – users can specify which elements they feel affects accessibility. This approach allows for variation of needs and enables the user to take control – empowering them even – not to mention the likelihood of enhancing the user's web experience.

After web pages are assessed for elements that affect accessibility, they are then rated according to individual user needs. A pathway is then created with the most accessible page being presented to the user first.

My research involves three studies. The first study involved gaining user-defined ratings of elements that affect web pages. Participants with visual, mobility and cognitive/language impairments were asked to perform three tasks searching for information on the web. They then had to specify three elements that they felt affected the accessibility of the web pages they accessed – the first being the most severe (see Figures 1 and 2).

The second is a participatory design study using iterative prototyping and testing techniques involving potential end users. The final study will be an empirical investigation measuring the effectiveness of the system, in comparison to using a traditional search engine. Measures of performance are likely to include the number of actions needed to complete a task, number of sites visited and user experience.

After analysing the data from my first study and talking with various disabled/elderly users, I found that there is a fine line sometimes between accessibility and user experience. This is particularly prevalent amongst the elderly where a garishly coloured background will deter users. The



individualised selection approach that the proposed system offers will enable advanced filtering options. The user can then indicate a preference for specific backgrounds, fonts and colours.

I am currently designing my final experiment and aim to conduct it as a two-part study using two groups: elderly and disabled people. The hardest part of conducting a study, I always find, is finding willing participants. If anyone has any contacts with any educational institutions or care homes in the Sussex/Hampshire/Wiltshire/Somerset area, I would be extremely grateful. You can contact me at Alice.good@port.ac.uk if you would like to volunteer or if you would like more information.

Alice Good

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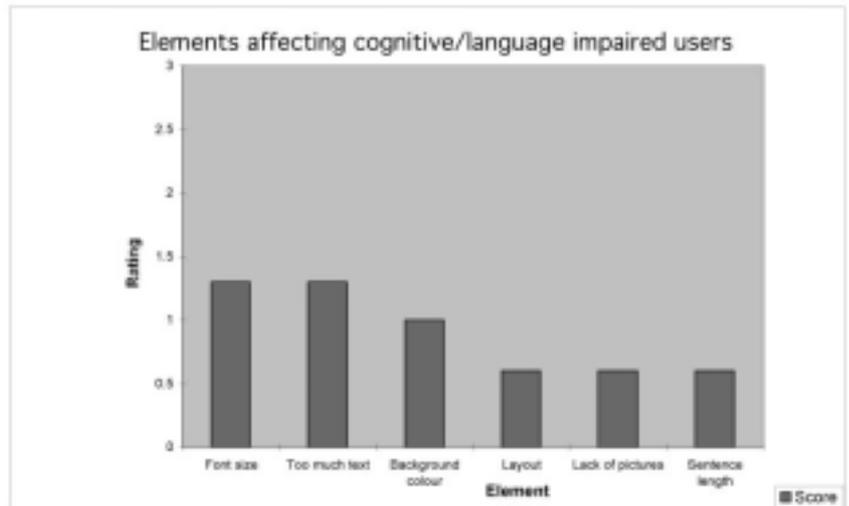


Figure 2 Elements affecting cognitive/language users.

My PhD

Design and evaluation of virtual prototypes for MEMS

John Payne

I left my degree course adamant that I was finished with education and I would go off and find a real job. Unfortunately the real jobs weren't very inspiring compared to my work at the Glasgow School of Art's Product Design Engineering Course. I wanted to find a career that utilised my design skill as well as my knowledge of engineering.

Following on from my final year work, which was concerned with the design of a rugged wearable computing system, I found a short-term position developing prototype service control rooms for BAE Systems. This entailed the rapid mock up of full scale rooms so that scenarios could be assessed with real people. Issues of line-of-sight and communication were vital to a successful design and, as with any large organisation, there were many views as to how the room should be organised. This example showed early in my career that the assessment of physical usability, combined with not only an environmental awareness but also a situational awareness, is paramount to understanding how a system will function in the real world.

I soon realised that throughout my course and employment my real interest had been physical human factors – this was before I had even heard of the term 'usability'. Glasgow School of Art's Digital Design Studio (DDS), in collaboration with QinetiQ, then offered me an opportunity that would help me to expand upon my interests and develop my skills: a PhD concerned with the use of 3D visualisation and interaction techniques, and how they may benefit the design, evaluation and assessment of MicroElectroMechanical Systems (or MEMS).

MEMS is a term used to describe small mechanical systems with dimensions in the scale of microns. They are primarily used as environmental sensors that can be designed as part of integrated electronic circuits. Current applications include inertial sensors, pressure sensors and gyroscopes. MEMS even form the major component of Digital Light Processing (DLP) Projectors. This relatively young field is rapidly advancing in complexity and the development of new 3D design tools to aid designers is critical to maintain this technology's forward momentum.

During the first year of my PhD I discovered that there was a large interaction and functionality gap between the types of system that were used for high-end 3D visualisation, such as oil and gas exploration, and more common office-based design tasks.

The high-end 3D visualisation systems often immerse the user within an expensive virtual environment, wearing 3D glasses and using a 3D mouse. The level of functionality is relatively limited to navigation and selection, compared to the much lower cost, yet highly functional, solid modelling workstations that can be seen on a typical designer's desk. In the high-end applications, supercomputers drive stereo (3D) applications with a whole host of devices hooked up to provide the user with a means to 'interact' with the data. Compare this to the more common user of an engineering design or graphics workstation whose method of interaction is wholly based upon moving between a mouse and a keyboard. I became interested in bringing increased functional 3D interaction to the desktop workstation.

This vision fits with the trends in hardware development. PC graphics cards are improving at a tremendous rate and will soon allow cinematic 3D effects in real-time on a desktop machine. These rapid advancements in the display of graphics imply a relation to Moore's law which predicts the logarithmic advancement of processor power in relation to lower costs. However there isn't a similar law for interaction. Why not?

It's with this mission in mind that I am focusing upon the implementation of 3D elements within the common desktop windows environment. The use of low-cost 3D interaction devices that are unobtrusive may bring about new ways of using computers in the future. Through integrating the recent work in physical interfaces (tangible interfaces), two-handed interaction (bi-manual input), and the use of multiple methods of engagement with the computer, such as audio, touch, voice, gesture (multimodal interaction), a new and achievable interaction space could be defined.

I am currently focusing on the design and evaluation of 3D interfaces for the inspection of virtual MEMS prototypes. The

design of MEMS is inherently 2D, as they are built up from 2D layers, but the visualisation is 3D since the layers combine to form a 3D mechanical structure. The visualisations often involve numerous levels of data to be presented simultaneously so that the designer can investigate relationships between different phenomena. The development of an active 2D and 3D design space that allows designers to engage with the system in different ways in different scenarios is expected to improve design communication and team evaluation. By creating a stronger cognitive link between the 2D elements and resultant 3D prototype geometry these new 3D interfaces aim to improve the performance, comfort, functionality, and team communication of the current MEMS design process.

Finally, between the DDS and QinetiQ I have found a

happy medium between physical human factors, psychology, and engineering design. I think the types of 'thinker' in the field of HCI are becoming increasingly diverse as every year passes. It is becoming more and more frequent that art schools and designers are embracing computing as an expressive medium. Just look at last year's keynote speaker, Hiroshi Ishii, and his collaborations within the school of architecture. To me, this is one of best things about the BHCI Group. You really don't know who you will bump into at Leeds this year: a Computing Scientist, a Psychologist, or even a Fine Artist.

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Thank you for the generous response to last issue's call for contributions to the 'My PhD' column. Two of the articles that we received are featured in this issue; *Interfaces* 61 will contain the submissions that we couldn't fit in this time. Contributions for future issues are still welcome so please keep them coming. Send submissions or queries to Martha Hause, the My Phd Editor, at m.l.hause@open.ac.uk

Book Reviews

Edited by Sandra Cairncross

Another varied selection of books to help you plan your autumn reading as the nights start to draw in.

Firstly, Professor David Benyon, Head of the HCI research group at Napier, provides a detailed review of *The Handbook of Task Analysis for Human-Computer Interaction*, edited by Dan Diaper and Neville Stanton. This is a key text, which explores the current state of research and use of task analysis for Human-Computer Interaction (HCI).

John Knight provides reviews of two books which focus on different aspects of design – *Where Stuff Comes From: How Toasters, Toilets, Cars, Computers and Many Other Things Come to Be As They Are*, followed by *Design Research: Methods and Perspectives*.

Shaun Lawson then reviews *Rules of Play: Game Design Fundamentals* – a new text aimed at game designers and the growing number of students taking courses in game design, which analyses not just computer games but also video games and even board games and puzzles.

And finally we have

the welcome return of my predecessor, Kristine Faulkner, with a review of *The Mobile Connection*, described by Kristine as a 'delightful book', which explores the impact of the cell phone on society.

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The Handbook of Task Analysis for Human-Computer Interaction
Dan Diaper & Neville Stanton (Editors)
Lawrence Erlbaum Associates, 2004
0-8058-4433-3, £29.95

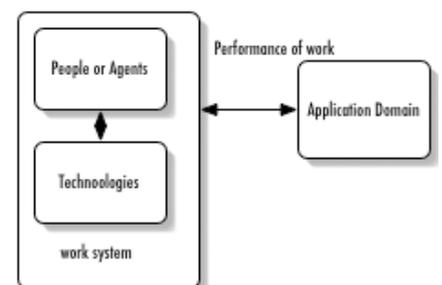
Two of the key 'names' in the world of task analysis, Dan Diaper and Neville Stanton, have come together to edit this definitive book on the subject of task analysis. *The Handbook* has thirty chapters covering the whole gamut of task analysis techniques with some good introductory material and some philosophical considerations from the editors. John Annett, for example, provides an excellent, clear description of Hierarchical Task Analysis (HTA) complete with a step-by-step guide, and Fabio Paternò describes his highly detailed method, ConcurTaskTrees. There is a section of five chapters devoted to industry methods, and several other formal software engineering methods are described and illustrated. David Kieras provides the

chapter on the GOMS (Goals, Operations, Methods, Selection rules) method, and Kentaro Go and John Carroll provide the chapter on scenarios. In short, this is a most comprehensive handbook that includes most of the major contributors to the field of task analysis over its forty year history.

The notion of a 'task' has been central to work in human-computer interaction since the subject started. Undertaking a task analysis is a very useful technique – or rather set of techniques – for understanding people and how they carry out their work. Looking at the tasks that people do, or the tasks that they will have to do because of some redesigned system, is a necessary part of human-centred design. Some authors consider 'task analysis' to encompass all manner of techniques (such as interviewing, observation, development of scenarios, etc.) but I find this rather too general and all encompassing. Task analysis is

a specific view of interactive systems design that leads to specific techniques.

The concept of task derives from a view of people, or other agents, interacting with technologies and trying to achieve some change in an application domain. Taken together, the people and technology constitute what is sometimes called a 'work system' which is separate from the 'application domain'. The domain is seen as some abstract representation of the real world (see figure). Importantly task analysis is concerned with some





aspects of the *performance* of a work system with respect to a domain. This performance may be the amount of effort to learn a system, to reach a certain level of competence with a system, the time taken to perform certain tasks, and so on.

In Chapter 1 of *The Handbook*, Diaper provides his full definition of task analysis:

Work is achieved by the work system making changes to the application domain. The application domain is that part of the assumed real world that is relevant to the functioning of the work system. A work system in HCI consists of one or more human and computer components and usually many other sorts of thing as well. Tasks are the means by which the work system changes the application domain. Goals are desired future states of the application domain that the work system should achieve by the tasks it carries out. The work system's performance is deemed satisfactory as long as it continues to achieve its goals in the application domain. Task analysis is the study of how work is achieved by tasks.

This view of the separation of work system and domain is not shared by everyone (e.g. Benyon, 1998) but this definition does result in some useful task analysis techniques for systems analysis and design. *The Handbook* is the place to go to find them.

Balbo, Ozkan and Paris, in their chapter 'Choosing the Right Task-modelling Notation: A Taxonomy', emphasise the expressive power of different methods. For example, they focus on whether a technique captures optionality (is a task mandatory or optional in pursuing a goal), parallelism (can tasks be performed in parallel), or non-standard actions such as error handling or automatic feedback. They also classify methods along the axes of:

- The goal of using the notation – by which they

mean the stage in the development life cycle; is it best for analysis, design, evaluation, and so on.

- Its usability for communication – some task analysis techniques can be very hard to read and understand, particularly those that are based on a grammar rather than graphical notation.
- Its usability for modelling tasks – task analysis methods have to fit into the software development process and be used and understood by software engineers. It has long been a problem that software engineers do not have ready access to a good task analysis technique.
- The adaptability of a task analysis technique to new types of system, new aims or new requirements (e.g. a task analysis technique aimed specifically at web site design may not be very adaptable). To what extent is the technique extensible to other purposes?

This allows readers to compare methods such as User Action Notation (UAN) with GOMS with Use Cases and other proprietary methods. Indeed *The Handbook* details several such methods, such as Diane+, which are described in detail.

The linking of task analysis with the engineering of the final system is a theme picked up by several of the chapters and remains a perennial problem; how to take a description of human tasks and present it to programmers. The key issue at stake is the semantics that are represented in the method and captured by the notation. Different approaches to task analysis use different concepts and the concepts that are selected will affect the analysis and design that is done. Turner and McEwan, for example, discuss activity theory in their chapter with its concept of the 'object' (or objectified motive) of an activity. They use the theory to evaluate a virtual training environment, looking for contradictions and possible breakdowns in the design. May and Barnard take a very different approach, adopting a *cognitive* task

analysis method based on Barnard's interacting cognitive subsystems theory of cognition. They seek to identify the cognitive resources that an operator will require to perform a task.

In their concluding chapter, Diaper and Stanton make an important observation regarding many task analysis techniques, namely that they are usually mono-teleological. That is to say they assume that the agent or work system has a single purpose which gives rise to its goal. Teleology is the study of purposes, causes and reasons, a level of description of activities that is missing from most task analysis approaches. In reality, of course, people and work systems may be pursuing multiple goals simultaneously. Perhaps the one main approach that is missing from this collection is the Riso genotype that deals with teleology and a means-end analysis. This work was pioneered by Jens Rasmussen in the domain of process control and is continued by people such as Vicente (Vicente, 1999).

Task analysis is an important part of systems development. During analysis, task analysis is concerned with the practice of work, with the current allocation of function between people and technologies, with existing problems and with opportunities for improvement. During design and evaluation task analysis is concerned with the cognition demanded by a particular design, the logic of a possible design and with future distribution of tasks and actions across people and technologies. *The Handbook of Task Analysis for Human-Computer Interaction* is an excellent collection of chapters, well organised, well structured and well edited. I hope it takes its place in every library and I am sure it will sit on the bookshelves of practitioners and academics too. For those looking for details of methods, for comparison of methods, for step-by-step guides to methods, or for a comprehensive survey of methods, this is the only book they'll need.

Benyon, D. R. (1998) Cognitive Ergonomics as Navigation in Information Space. *Ergonomics* 41 (2) Feb. 153-156

Vicente, K. (1999) *Cognitive Work Analysis: Toward Safe, Productive and Healthy Computer-Based Work*. Laurence Erlbaum Associates, Mahwah, NJ

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Where Stuff Comes From: How Toasters, Toilets, Cars, Computers and Many Other Things Come to Be As They Are
Harvey Molotch
Routledge, 2003
0-415-94400-7, £16.99

This is a thought-provoking read, and raises salient issues for designers and researchers. It asks a fundamental question: Where does stuff come from? The answer is not startling, but ingenious connections are made in tracing the evolution of everything from toasters to cars. Understanding material culture is an ambitious and important project to do in fewer than 300 pages. Harvey Molotch writes accessibly, with passion, and argues that 'At the most profound level, artefacts do not just give off social signification but make meaning of any sort possible ... objects work to hold meaning more or less, less still, solid and accessible to others as well as one's self.' (p11).

He starts by looking at professional designers. This is an impartial inquiry with some uncomfortable conclusions including gender bias. 'Her comments were pungent ... "if women did more designing, products would be simpler ... I'd like to add up all the money that's been lost by white male arrogance".' (p50).

Molotch suggests a blurring of research and design. So that we find 'Designers ... may create "style boards" ... [and] use techniques more familiar to social scientists like ethnographic observation, time and motion studies and focus groups.' (p45).

The six main chapters describe the hard (people, places, organisations and activities) and soft forces (history, culture, identity) that shape the evolution of stuff. While cataloguing influences, intriguing networks and landmarks come to light. For example, he explains how 'to put a train on U.S tracks, its wheels need to span the standard 56 and half inches, a convention the Americans adopted from the British rail system.' (p106). It transpires that this measure originated from the Roman Empire's wheelbase and is used to transport the Space Shuttle's Booster Rockets.

The American Professor of Sociology ends the book arguing for a community that can make 'some strategic improvements' (p20) to material culture. He advocates a cross-

disciplinary 'creative commonwealth' (p257), based on 'Moral Rules', that utilises 'Designers' Good Vibes'. In carving out a path from 'Douglas and Isherwood's ... largely unheeded-call for an "anthropology of consumption"' (p7) to Walter Benjamin's 'Arcades Project' he manages to unite contemporary HCI concerns of suprafunctional use qualities with an alternative but insightful design and research tradition.

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Design Research: Methods and Perspectives
Brenda Laurel (ed)
MIT Press, 2004
0-262-122634, \$39.95 (US List price)

Is this an HCI book? Or is it a design book? It manages to be both, merging design and research; it shifts the focus from analysis and evaluation to solutions. This is a largely non-academic book and most contributors work in 'new media' or the social sciences rather than traditional HCI. Most authors were new to me, apart from some notables, including Nathan Shedroff, who contributes a great chapter on experience design. Nearly all of the writers are American and based on the West Coast. This has a notable impact on content, including the emphasis on personal narrative accounts, which sometimes makes the content appear slight.

The book is over 300 pages long and includes over 30 chapters. These are divided into four sections (People, Form, Process and Action). Laurel has written three chapter introductions, as well as one of five short 'demos'. These are short, thought provoking pieces and hers is entitled 'Design Improvisation: Ethnography meets Theatre'. Like most of the writing, it takes ideas from *Computers as Theatre* and applies them to the commercial world of her last book *Utopian Entrepreneur*.

Most of the projects demonstrate an equitable relationship between research and design and merging of disciplines. The need to get this right is suggested in Laurel's introduction: 'Design has power ... Design has consequences. The question is not whether consequences exist, but rather whether they are intended, by whom, and to what purpose. The challenge for

designers is to claim and direct the power of their profession.' (p19)

The title is somewhat misleading and those expecting a manual may be disappointed. Despite this, the first chapter describes twenty-two design research methods. The stress is on qualitative approaches with ethnography taking centre stage. The focus of *Design Research: Methods and Perspectives* is on the early stages of design, including user requirements and conceptual design.

The chapters that focus on 'perspectives' are illuminating. These are typically first hand accounts of commercial, new, product development projects. The experiences of working in diverse and innovative application areas (including cinema and games), are useful and deal with critical issues including organisation. I liked this book and valued its content. The shared philosophy of its writers is a good one and the book brings design research to a wider audience through its attractive design and readable content.

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Rules of Play: Game Design Fundamentals
Katie Salen and Eric Zimmerman
The MIT Press, 2004
0-262-24045-9, 32.95

Games design and development is considered by many to be an important subject in contemporary computer science with many UK universities already offering full undergraduate and postgraduate games-related degree programmes. The Admissions officers of the Schools and departments offering such degrees will usually confirm that the competition for places is strong.

Students applying to study on games degrees often do so with an enthusiasm for the subject which has been nurtured through their own personal exposure to games played either in darkened rooms on games consoles, or, more and more frequently, out in broad daylight on handheld devices such as mobile phones.

In fact, mobile gaming is predicted to rapidly become an extremely important, financially lucrative, technology domain. Sony, for instance, plan to release a new handheld 'baby'



PlayStation, the PSP (PlayStation Portable) later in the year to compete directly against the well established Nintendo Gameboy products and Nokia's much more recent N-Gage hybrid mobile phone/game console.

The restricted hardware of devices such as mobile phones has forced games designers to reconsider their options – implementing full blown 3D graphical games to a level that is possible on a modern game console is simply out of the question on a phone.

Mobile games therefore typically have a very retro feel to them – the simple, but highly engaging, attractions of games like PacMan, SpaceInvaders, and even Pong, have received new scrutiny and evaluation as developers struggle to produce games that can run on devices with limited power, input options, and screen size.

To kick-start their quest to rediscover the attractions games like PacMan, modern designers of games ought to pay close attention to many of the topics covered in the book *Rules of Play: Game Design Fundamentals*. The authors, Katie Salen and Eric Zimmerman, have attempted, in a hugely ambitious and academic way, to analyse all aspects of game design – and not just computer games either – but all games – including video games, board games, sports, paper puzzles and gambling.

In fact, the authors go to great lengths to point out that their book is not about computer games at all. This is in some ways, one suspects, a creditable lunge towards academic seriousness, but is a shame, in other ways, as the vast majority of the book's readers will, in fact, be computer games designers. Whilst most such readers will appreciate the need to broaden their horizons to other types of game, many will be left with the feeling that their genre is being slightly discredited.

Even Salen and Zimmerman themselves appear to be great devotees of computer games and dedicate almost their entire Preface to an analysis of Pong – what more could a modern computer game designer ask for? In fact, this book exudes an appreciation and dedication throughout to a bygone era of computer game design – an era when designers faced such appallingly poor graphics and computation performance that their

game had to feature something other than a gun-toting girl in tight 3D shorts to get the public interested.

The book is split into four sections, or Units (Core Concepts, Rules, Play, and Culture), with each Unit further sub-sectioned into a great number of topics. My opinion is that this structure does not work – the book can be extraordinarily difficult to read – not on a page-by-page level but as an overall product. A more traditional structure outlining how one ought to go about game design in a chronological sequence might have been a better option.

As I've already mentioned, the book is ambitious in scope – but one feels that the kitchen sink is in here. Make no mistake – this is a big book – and many topics seem to receive a bizarrely over-verbose amount of coverage. I would never have expected several pages devoted to telling me how my central heating works (Chapter 17: Games as Cybernetic Systems) in a games text book.

On the other hand, it is a unique product – no other text has attempted to describe game design in such an academic fashion and to such great depth. It has received very mixed reviews already – many of the more indifferent reviews have sneeringly dismissed it because it doesn't tell readers how to write computer games. This is harsh and inappropriate – readers seeking such material should look elsewhere. For instance, Chris Crawford on Game Design is good start – but such a book lacks academic credibility and is more a sequence of anecdotes by someone who has been there and done that.

The whole notion of computer games design and development is still often labelled as a non-academic pursuit. This is wrong – games technology draws on many aspects of human computer interaction, 3D graphics, software engineering, real time systems, and product design – indeed it is the games industry that has dragged many of these areas forward in recent years. The topic of virtual reality draws on similar areas but still remains largely hidden in our research labs. Yet VR is still considered a worthy academic topic to pursue (has anyone defined, let alone measured, presence yet?).

By the creation of their book Salen and Zimmerman therefore ought to be

congratulated in their attempt to draw more attention to the huge body of academic material that underpins game – and yes – even *computer* game design. They state that their main objective was to produce a book to catalyse much more discussion in this area. Though their result is flawed in a number of ways it still achieves this aim.

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The Mobile Connection
Rich Ling, 2004
Morgan Kaufmann
1-55860936-9, \$34.95 (US list price)

This is a delightful book by Rich Ling on the subject of the cell phone and its impact on society. It isn't a long book – just 244 pages – and is very readable so seems a breeze. I read it quite happily on the train to and from LSBU over a few days and it kept me engrossed. In fact, I'd originally intended to just read the chapters I thought would be relevant for my own work but so much fun did I find it that I ended up reading it in its entirety though not in the order the author intended. I don't think it matters. Rich Ling obviously sees a progression through the book as he's designed it this way but I don't think I missed out by playing hopscotch through it – there are only occasional moments when he refers to something he has mentioned earlier but mostly I knew what he meant in any case as I've done a fair amount of reading on the topic. Given that, it'll be useful for anyone who is currently studying aspects of mobile technologies and doesn't want to have to read it all the way through. And of course, it'll be excellent for students who want to dip into various chapters.

Rich has lots to say about the mobile. He has studied the background very thoroughly and knows his material. He has also carried out his own work and some amusing sociological 'experiments' which give an interesting slant on what people are doing with their mobiles and how they perceive them. The interview material with parents and teenager mobile users was also fascinating stuff. Rich has managed to walk that careful tightrope which many of the writers I've read can't manage at all. They're either bowled over by mobiles or



consider them to be the last deadly evil to humankind. Rich tells it how it is – there are no moral or value judgments here but yet at the same time he manages an empathy with the people he has interviewed.

There are eight chapters which are more like sections with various essays making up each one. Chapters 1 and 8 are introduction and conclusion so in fact what goes on in between is an examination of the various aspects of the mobile phone that have grabbed Rich's attention: safety and security, co-ordination, the mobile telephone and teenagers, the intrusive nature of the mobile which was made all the more poignant by the fact I read it on the train with the background of 'and I said to him' one-sided conversations taking place about me. And finally he examines – the aspect I'm interested in – texting.

The book uses a wealth of interview material, a lot of which appears to be with Norwegians so that some of the translations seem a bit stilted or perhaps Norwegians really speak like that? I found these sections very endearing if rather oddly phrased and they did shed a great deal of light on ordinary people's uses of and attitudes to the mobile phone. Sometimes what emerged was an almost love-hate relationship with it. This is particularly true in the sections about teenagers where parental desire for control over youngsters conflicted with the feeling

that perhaps youngsters shouldn't have phones and what were they doing with them in any case? I was particularly amused by the repressive attitudes of those just out of teen years who took the view that as they didn't have mobiles when they were 13 why should anyone else! I just hope they aren't in charge of progress elsewhere. But what emerges in these attitudes is that society is still trying to figure out how it should use this new form of communication and it is developing the manners needed to deal with the technology. Rich talks about such issues at length with a clear-minded vision that values the technology but sees it needs to be socialised properly. At the moment it is barely house-trained.

There is a very thorough list of references and the text is well referenced throughout. Rich also makes ample use of his own work to give the book a charming immediacy. I loved the Norwegian slant and the many references to work done in Finland perhaps because the first pieces I read on texting were the studies by Finnish sociologists.

Most of the stuff I've read on text messaging has been papers and collections of essays so it was very nice indeed to see SMS discussed as part of the larger issue of the mobile phone. I particularly enjoyed the way that Rich has taken the various interesting issues and put them into a context. This is an

extraordinary book – a mixture of the technical, the HCI, the sociological, and the psychological. There's a quote from Norman on the book saying 'It's not about technology; it's about people' and I sort of agree with him but not entirely. What Rich has managed to do here is to show that dividing life up into various aspects and saying the proper study of HCI or sociology or psychology or even computer science is this or that, is nonsense. When you look at the technology you finally have to look at the impact and vice versa. If you don't, you end up not understanding very much at all.

I can't recommend this book highly enough. You could pack it into your bag and take it on holiday. It's the kind of book that will entertain you as much as the latest Pratchett – though it might not make you laugh quite so much. This is definitely a book for your shelf (but read it first!) and a copy for the library should help out those students 'into' this fascinating and growing subject area. This book could be shared by psychologists, HCI experts and sociologists alike. I wish all books I had to read were this informative and this much pleasure. Thank you Rich Ling for a job very well done!

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CFP

3rd International Conference on
Pervasive Computing

PERVASIVE 2005

8–12 May 2005 • Munich, Germany
<http://www.pervasive.ifi.lmu.de/>

Submission Deadline

6 October 2004

Call for Workshop Proposals

10th International Conference on USER MODELING UM05

July 24–30 2005 • Edinburgh, Scotland
[http://gate.ac.uk/conferences/um2005/
um05.html](http://gate.ac.uk/conferences/um2005/um05.html)

The UM05 Committee invites proposals for workshops to be held in conjunction with the 10th International Conference on User Modeling (UM05)

Important dates

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November 15 2004

Final workshop proposals:

December 6 2004

Workshop paper submissions:

March 7 2005

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Human Computer Interaction Track
of

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May 15–18 2005 • California, USA
www.irma-international.org

Submission Deadline

October 4 2004

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May 30 – June 4 2005 • Taipei, Taiwan
www.cscl2005.org

Submission Deadline

Full and short papers: **15 November 2004**
Doctoral Consortium, Panel, Workshops:
15 December 2004



Profile

Ann Light talks to Alan Dix



Ann Light is best known as editor of Usability News and when not busy with that, also consults on communication strategy, marketing and usability. It's a varied life. For instance, her industrial experience includes managing research for the User Advocacy Group, working ethnographically to represent passengers more fully to transport developers. She attempts to balance this with an academic presence: she is visiting research fellow at the University of Sussex, under whose wing she publishes on interaction design and networked communication. She is also part of the HCI community that seeks to introduce insights from arts and humanities into digital product design (the latest workshop in a series

takes place at HCI2004: <http://co-project.lboro.ac.uk/users/coac2/HCI2004.htm>).

Before devoting herself to the relationship between users and technology, she was a political journalist and her first serious job was drama teaching in a London comprehensive, an early example of her interest in interaction design. Her education includes an English degree, a PGCE in Drama, an MSc in Knowledge Based Systems and a PhD in 'Interaction through Websites' (completed in 2000), for which she developed an interviewing method subtle enough to reveal changes in users' attention – see *Interacting with Computers*, 13(3).

In her spare time, she is an advisor and chair of trustees for the Video Educational Trust charity, which uses digital and networked media to support cultural exchange between communities in the UK and Ghana. At present, she is also setting up Transform-Ed, an initiative to highlight the need for education that responds to the increasing digitisation of society and its institutions, so that ordinary people can continue to participate as the invisible information systems of pervasive computing replace the structures of a simpler world.

What is your idea of happiness?

A warm summer's afternoon near water, with good friends or a good book.

What is your greatest fear?

Stagnation.

With which historical figure do you most identify?

Probably with all the unsung millions that didn't make it into the history books.

Which living person do you most admire?

Nelson Mandela. He just came straight to mind... there may be others.

What is the trait you most deplore in yourself?

Impatience; a greater interest in starting things than finishing them.

What is the trait you most deplore in others?

Tuneless humming.

What vehicles do you own?

An aging Saab convertible; a bicycle.

What is your greatest extravagance?

My Saab convertible.

What objects do you always carry with you?

The most unusual object that always comes along in my handbag is a spoon. It can be very useful.

What do you most dislike about your appearance?

On bad hair days, my hair, etc... you get the idea.

What is your most unappealing habit?

I believe it's interrupting people.

What is your favourite smell?

Oh... woodsmoke; gardenias; vanilla; spring evenings; good curry... the list is long.

What is your favourite word?

In honour of my father, whose favourite it has been since my mother first grew them in the garden of my childhood: mesembryanthemum.

What is your favourite building?

My lovely little house in South London... or Chartres Cathedral... or Brighton Pavilion... or anything by Le Corbusier... or..., or...

What is your favourite journey?

I adore journeys... to new places, to well-loved ones; especially by train.

On what occasions do you lie?

When the truth is neither necessary nor helpful.

Which words or phrases do you over-use?

oops... sorry... actually... just... The all-British 'Hugh Grant' School of Apologetic Living

What is your greatest regret?

Only having one life to do everything in.

When and where were you happiest?

That's all still to come.

What single thing would improve the quality of your life?

A clone. Several would be even better.

What would your motto be?

It's only a mistake if you do it twice.

What keeps you awake at night?

Having interesting ideas.

How would you like to die?

Quickly and discreetly.

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