

Interfaces

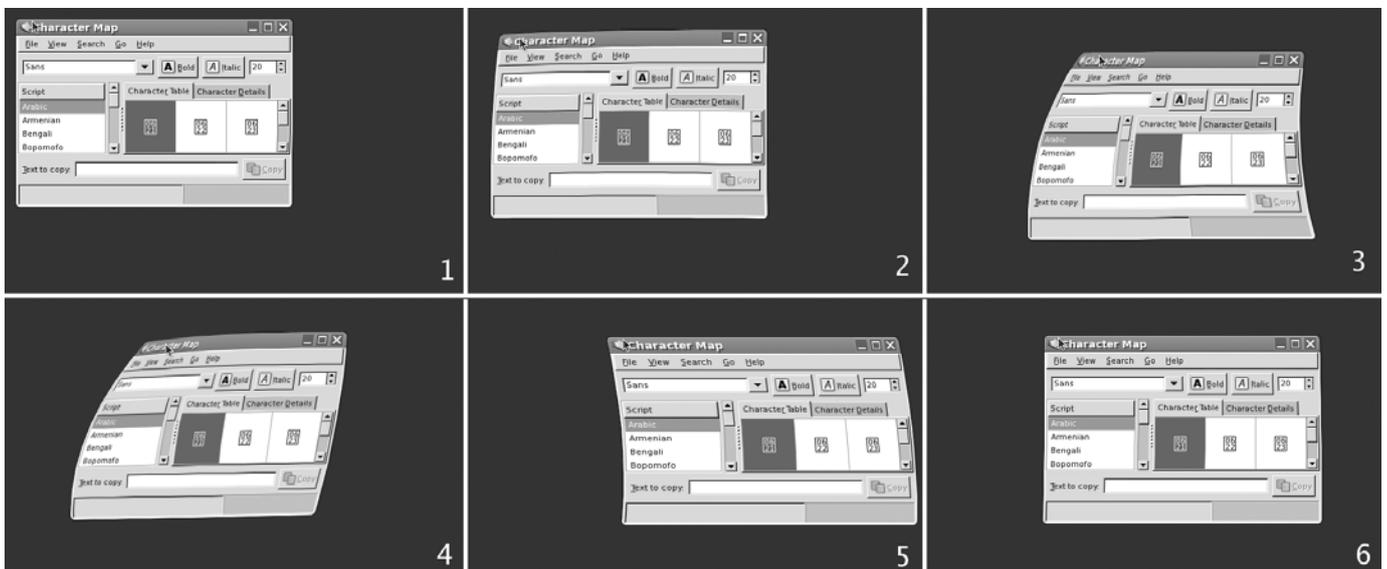
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British
HCI
Group
www.bcs-hci.org.uk



In this issue
All the
regulars
plus

Seth Nickell talks Wobbly Windows
Ann Light talks Accessibility
Frode Hegland talks to his computer
Paul Curzon talks to robots
and Yvonne Rogers and Michael Underwood talk about where HCI
has gone in 20 years ...





View from the Student Chair

I graduated from Northumbria University as a mature student in 2003 with a BSc (Hons) Psychology and began work on my PhD in January, investigating the social and moral implications for children using communication technologies. I also teach Research Methods and Analysis.

So how did I get here? Well and truly by accident is the honest answer. I spent eight years living in Europe as the wife of a serving soldier, eventually returning to the UK in 1994. Three children and several postings later, we settled in the North East where I trundled off to the local college for some 'brain food' with the vague idea of doing something 'in computers'. Fortunately (?) the course was oversubscribed so, rather than head home defeated, I accepted a place on the only course with vacancies, the Psychology class. Having gained an 'O' level and being made fun of for having an 'ology', I reluctantly followed the Higher Education Foundation route into university.

I say reluctantly because, having been a stay-at-home mum for so long, I worried constantly about the effect my absence was having on the children. Of course it had no effect whatsoever other than encouraging them to do their homework because Mummy had to do hers too.

After graduating from Northumbria and literally refusing to leave, I worked on various research projects and eventually began teaching statistics to first year undergraduates. It was only a matter of time (and dogged persistence) before I secured funding for my PhD. This is where my introduction to HCI began. I share an office with members of Northumbria's PACT Lab, notably Linda Little and Liz Sillence whose work on trust and privacy whetted my appetite. Always interested in Developmental Psychology, I was aware that from an HCI perspective most research involving children focused on value centred design, usability or safety issues. I felt there was a need to address human values, not from a design perspective but from a social and moral standpoint. With the recent spate of 'happy slapping' incidents reported in the media, it seems I have embarked upon a timely venture.

I approached the role of Student Chair with an air of trepidation, knowing very little about Human Computer Interaction. My first COG meeting in May was dreadful. My bit was seventh or eighth on the agenda by which time I was beside myself. I had at the beginning of the meeting begun to make a note of all the acronyms being used: COG, CHI, HCI, IEEHF, IFIP, IPR, IWC, IXD, OCR, TC13, UN, UPA oh yes and WIKI. Now I have to tell you, for a girl who has just about mastered ITV, BBC and MFI I felt utterly out of my depth.

It then occurred to me that I was the perfect choice for Student Chair, identifying entirely with new students coming to HCI, the abbreviations really don't matter. My role is to liaise with the student reps and voice student issues (no matter how trivial) to the Chairs and Officers Group (COG). So there it is, not as scary as first imagined and in case you were wondering, I still don't know what all the abbreviations stand for. TTFN!

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If you're interested in becoming a student representative on one of the British HCI Group committees, or just want to know more, see page 13.

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Hello, and welcome to *Interfaces* 64 and HCI2005!

A couple of days after receiving Robert St Amant's column (page 23) about how improvements to existing designs can be at the cost of their usability, I had to show my Mum how to switch on and operate my new cooker hob. Okay, okay, I know, a cooker hob shouldn't be sooooo difficult to operate that you have to show your Mum how to switch it on. But this is a **cool** cooker hob. And that makes it all right. Honest – you'd agree with me if you met it.

It's an electric hob with a ceramic surface that's completely smooth apart from a removable magnetic knob. You use the touch-sensitive power symbol to switch on the hob, then, within three seconds, you slide the magnetic knob in the direction of the hob ring that you want to switch on. Then, while the hob ring's indicator is flashing, you spin the magnetic knob to the right temperature level. It's that simple. Well, it is if you've used it once or twice before. I have to admit, I did read the relevant bit of the manual before I first used it. And after, I'd shown my Mum how to use it once or twice, she's fine with it too.

So, usability people tend to say that the first time you use it it should be intuitive and, generally, I'd agree. But, in this case, I think the novelty of the hob's design makes up for having to read a page or two of its short manual. I admit that I don't use its more advanced functions (like the child lock – I don't need it – and the macro-recorder – I don't really need that either but it's kind of fun to tell geeky acquaintances about) because I'd have to read the manual to work out how to. But the basic functions are easy to use after the first, brief learning curve (though, I probably wouldn't set my non-technical, 90-year-old Grandma on it (page 10).

So, I don't know whether Russell Beale (page 5) would rate my cooker hob as highly as his iPod in the design and

usability stakes: it's clean (usually), elegantly simple (in looks), though its interface is maybe not so obvious as it could be. But I'd bet he'd think it cool, as cooker hobs go. I'm perfectly happy with the input mechanism of my cooker hob but maybe my interactions with my computer could be smoother; Frode Hegland looks at making human-computer interactions on Web pages more useful in his Hyperwords project (page 18).

As the HCI conference is in its 20th year, Yvonne Rogers (page 8) and Michael Underwood (page 12) offer their respective views on where HCI has gone in those 20 years, and where it's yet to go. And Tony Rose and Ayelet Oettinger offer their experiences of paper prototyping a design of software for clinicians at Cancer Research UK.

Finally, this issue of *Interfaces* is Sandra Cairncross's last as Book Reviews Editor so I'd like to say a big thank you to Sandra for all her work over the past two years. For every issue since she took on the role, she's provided an excellent, varied selection of book reviews. And welcome to John Knight, who will be taking on her duties as of next issue.

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Laura Cowen is a Technical Writer at IBM Software Development Laboratories near Winchester, Hampshire. She previously worked as a Usability Researcher for an information design company in Milton Keynes, which included a very brief semi-academic career in eye movement and usability research.

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 27 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
Correction: the list of commissioning editors in *Interfaces* 63 should have included:

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

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Deadline for issue 65 is **15 October 2005**. Deadline for issue 66 is **15 January 2006**. Electronic versions are preferred: RTF, plain text or MS Word, via electronic mail or FTP (mail fiona.dix@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 35–63 can be found on the B-HCI-G web site, www.bcs-hci.org.uk/interfaces.html



Deflections

HCI with fewer 'just' causes

Gilbert Cockton

As I write, NASA's *Discovery* space shuttle hasn't taken off and won't for at least a few more days. There's a fuel sensor problem, but after a few days of looking, NASA hadn't found its cause to see how to fix it. That assumes there is a cause of the problem. Maybe there are several? In HCI, too much research and usability work focuses on single ('just one') causes of interactive outcomes, and thus descends, as I have argued before, into magical beliefs about the power of features and guidelines. Lessons from accident analysis may wean us off 'just' causes.

There have been no space shuttle launches since the *Columbia* disaster in 2003. Before that, launches were also suspended for over two and half years after the *Challenger* disaster. If we had to select the main ('just one') cause of that disaster, what would it be? Would it be the design flaw in the fuel O-rings? Or was there no flaw at all, but instead *Challenger* was launched in temperatures that were well outside the known safe parameters of the O-ring design.

Morton Thiokol, makers of the solid rocket booster that failed, tried to so persuade NASA for 12 hours before the launch. So, was the main cause NASA's decision to launch in the face of these concerns? If so, why did they do so? Was it the presence of a school teacher who would be the first civilian in space that pressured NASA officials into sticking to TV schedules, especially the need for President Reagan's State of the Union Message that evening to build Christa McAuliffe's *Challenger* trip into his re-election bid?

It's a long way from a cold O-ring to a chilling political sacrifice. As the usability engineer engaged to stop such problems happening again, what would be the main cause for you, and what recommendations would you derive from this? Interestingly, HCI people such as Chris Johnson do get asked to interpret such situations. Even more interesting is the complexity of tools (especially visualisations) that Chris uses to map out causal chains in accidents and disasters (e.g., in a forthcoming chapter, available on-line). Such tools are used to analyse sequences of events that can span weeks, months, or even years, and thus may well be overkill for the few minutes of human-computer interaction that span the emergence of many single usability problems. However, we can profitably borrow approaches to causal analysis from Chris's work.

There are challenges, however, in delving deeper into causal analysis in HCI, especially knowing when to stop. The metaphysics of cause is an unsettling intellectual territory that undermines most common-sense preconceptions about cause and effect, and yet also illuminates the apparently perverse reasoning that we can apply on a daily basis in HCI. For example, we regularly argue in HCI that the absence of design features will *cause* usability problems; for example, a lack of help, clear signposting and indications of context, or supporting information such as formats, ranges and units for form field entries. However, if the absence of something can be a cause, then such absences have no spatio-temporal location; that is, they are not events in the world that can be positioned at a specific point in a causal chain. Philosophically, such causes become *transcendental* rather than

immanent. Who would have thought that HCI would have recourse to arguments that are literally 'out of this world'? Still, there are ways to bring absent causes back into the world of immanent events. We should be aware of these and other philosophical tactics in response to causal dilemmas, even if we don't fully use them.

So, have a look on the web at Chris Johnson's work and the *Stanford Encyclopedia of Philosophy* and begin an escape from 'just causes' (one feature as a sole cause of problem) to complex causes. Once complexity is really embraced, we must take even more notice of users and usage contexts. The default is still too often to attribute causality to design features alone, and not to a web of system, psychological, and sociological factors.

This is especially the case in HCI research on design innovations, where simple experiments supposedly demonstrate the superiority of new features for all users and all usage contexts. One way to gauge the future maturity of HCI will be the predictions on design innovations being limited to specific combinations of users and usage contexts. If such circumscriptions could ever become the rule rather than the exception, then HCI's existing guidelines, patterns, principles, and rules would be replaced by something far more reliable. However, to get there, we need to develop multi-causal analyses in HCI that can reliably explain what will work when and why. In short, we have to put the *I* in HCI, basing all explanations and predictions on a complex interaction of system and human variables. We need to step beyond the opposing comforts of controlled experiments and detached ethnography to a systematic understanding of the breadth and complexity of human-computer interaction. Time to learn some more new stuff.

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Walking around the Hockney gallery at Salts Mill in Leeds, I was particularly struck by his pencil sketches of people sitting, or their face only portraits. Not typical Hockney in style, these are straightforward pencil representations. And they are not good. They aren't bad, but I've seen much better life drawings from art college students and many amateurs. I'd usually thought that modern artists were good at realism but chose an alternative form of expression, but now I'm not so sure. But the more modern prints I did like. Simple constructs of line, form and colour brought a vividness, passion and atmospheric representation of simple scenes – a chair, a swimming pool (typical Hockney), a view of a room. A few did not work – unbalanced areas of colour or a strange mixture of textures and, for me, the effect was lost – but so many of them were simple and evocative.

Where are the challenging interfaces, the dynamic, novel approaches that push us to reconsider what we do and how we do it?

And this led me to consider the relationship between modern art and interactive systems design. Modern art is an intensely personal thing, and yet as I wandered the gallery, the pictures that worked for me also seemed to work for others – and in the main, we agreed about the ones we'd buy, the ones we'd actually like to look at, and the ones we'd not give house room to. Often they were simple; obvious approaches to subjects that captured the key elements and left the rest out. Anyone could have done them. And yet until Hockney, no-one had. Simple, obvious ideas, so obvious that they'd been overlooked by everyone before him. And this is where the intersection with design is. Design should be obvious, should be clear, and often simple. It should not seem revolutionary, but should evoke in us the idea that we could have thought of it – possibly even that we did think of it, but simply didn't realise it on paper, in software, or in reality.

Art has the ability to ask questions of us, of how we perceive the world and our place in it, of what we actually see and need to realise to understand it. For me, modern art does this in a particularly clean and challenging way, and whilst all I really go on is if it works for me, I find that there is some form of representational approach that captures the essence of the subject. Conversely, interaction design seems to hide from confronting the user: it tries to be as bland as possible, seamlessly integrating into their current environment and asking nothing of them – it assumes that making no impact equates to usability, that improved productivity and more functionality is quite likely to be enough, as long as it is presented in an unobtrusive way. The computing version of elevator music, really. Where are the challenging interfaces,

the dynamic, novel approaches that push us to reconsider what we do and how we do it? We cannot afford to take this analogy too far: we have to perform tasks and manage our lives, and possibly many other systems as well, with computers, whereas with art its place is to augment the environment. But if art, glimpsed for a few moments, can enrich the soul and make us question our place on this planet and our efforts in it, then surely interactive systems, which we have to work with for hours at a time, can have a much deeper effect. Maybe they do – and that is why we have to be subtle, to be mainly bland, for fear of upsetting things too much, of causing seismic shifts: we can't cope with those every hour of the day, every time we use an application.

What has this to do with Hockney's bad life drawings? I'm not sure how I got from there to here, but I think the point is that excellence in one area is not a prerequisite for excellence in another – that knowing how to draw the human form in realistic detail is not critical for someone who created new styles of representation that are, arguably, more effective. Thus it may be that knowing details of human psychology, and technical systems, and programming, are not necessary preconditions for good HCI and interaction designers. It may give us confidence if designers can do such things, but the litmus test is: do we get it? Does it work? Is it usable, is it useful? And maybe there should be another test too. Does it challenge us, make us think, make us question? Does it make us feel that we would have done it that way too, if only we'd been in a position to be asked.

The iPod is one such system that is exactly like that. If you had to design a portable player, the iPod would be it. Clean, elegantly simple, obvious interface – it's how we'd all have designed it. All your music in your pocket, life to go. But it's slightly challenging too – so neat and yet so small, am I cool enough to own such a device, and so on. It's not because it's become popular that it's iconic – it's popular precisely because it's iconic – a classic before one was ever sold. If they'd asked me, that's what I've have designed for them – it's obvious, it's clear, it's simple – surely anyone could have thought of that...

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Sketches of HCI2005: The Bigger Picture

The conference that has everything Gauguin for it

The 2005 conference will be the largest for several years. We have a huge canvas to play with! If 11 full-day workshops, the Educators' workshop, a guest conference (IDEC2005), 6 full-day tutorials and the doctoral consortium scope out the subject matter on Monday/Tuesday, 5 keynotes, 30 full papers, and over 50 other contributions fill in that devilish detail for the rest of the week, with the conference Fringe and social programme offering some additional highlights.

In *Interfaces* 63, we profiled three of our keynotes – opener Mary Czerwinski of Microsoft Research, the legendary Ted Nelson, now of the Oxford Internet Institute, and conference closer Alistair Sutcliffe of the University of Manchester. Together they are a formidable array and easily worth a visit to www.hci2005.org to register (and pay) online.

Now we add the details of the two industry day keynotes, followed by an exploration of the three narrative themes of our technical programme. There's lots more than this of course – panels, posters, exhibition, interactive experiences and three hundred of the top people in HCI to socialise with. Delegates from over thirty countries have registered already. The conference dinner on Wednesday has been moved to the Caledonian Hotel so you can gaze over Edinburgh Castle at sunset while you dine.

Industry Day

Thursday is the industry day this year, opening with **Ashley Friedlein**, CEO of e-Consultancy.com, asking "Usability – who cares?" Practitioners will be familiar with the struggle to get even the most basic aspects of usability and accessibility accepted into business activities. Reaching 30,000 professionals working in e-commerce and online marketing, e-Consultancy.com is particularly influential and Ashley's insights will be invaluable to anyone trying to apply the fruits of HCI research into both the commercial and public sectors. Industry Day closes with **Jackie Lee-Joe**, Head of Brand Experience for Orange (Global Brand). Orange has pioneered the use of multiple channels to interact with their customers, and Jackie manges the brand experience across these channels. She'll outline the bigger picture of developing and implementing brand experiences. How usability contributes to this is particularly relevant. She has worked across airline, retail, internet and telecoms industries, including in-flight services and the Sydney Olympics.

In between the two keynotes are five parallel tracks, two especially for Industry Day. The Usability for New Media track runs over two 90-minute sessions, consisting of invited speakers and a roundtable discussion, from **Chris Rourke**, Director of User Vision, Edinburgh (How accessibility guidelines are no substitute for usability testing), **Tom Stewart**, Managing Director of System Concepts, London (Why standards are confusing and what we are doing to make them more usable), **Julie Howell**, Digital Policy Development Manager with RNIB, Peterborough (topic still to be finalised) and **Eric Schaffer**, CEO of Human Factors International, USA (How software usability is coming of age: the transition to mature and institutionalised usability). In the other Industry Day track, the morning session consists of three peer-reviewed presenta-

tions: Elizabeth Parrington & Neha Pathak's case study on the applications and benefits of multiple user research methods to explore usability and adoption issues of a call-centre application for a large US telco; IDEC2005 chair John Knight from UCE Birmingham presents "Avoiding the trap: alternative business models for HCI"; Rachael Rainbow et al. describe a user-centred redesign of the UK Home Office's web site, to meet strategic objectives and the needs of its intended users. The afternoon session consists of six short presentations on design methods and principles across cultures.

The other six sessions for Industry Day contain those conference submissions more suitable for a broader audience. Four are of full papers described below. In the morning Olav Bertelsen leads a panel looking at Scottish and Nordic approaches to the continuum that runs from knowledge transfer through expertise management to knowledge co-construction. In the afternoon one session is given over to six short papers that cover a spectrum of interface issues.

The conference Fringe is 5.30–8.30pm on Industry Day, and, in keeping with Edinburgh Fringe traditions, everything is very much unplanned, spontaneous and deliberately without quality control. Anything can happen and hopefully will! Following this we'll all hop onto one of the 20 or so Lothian buses an hour that connect the venue with the centre of Edinburgh (or saunter by the canal for half an hour), to a wild ceilidh planned by Professor Lachlan MacKinnon (now proprietor of a large chunk of the University of Abertay Dundee) in The Hub, home of the Edinburgh Festivals. If you can't make the whole conference, a ticket for Industry Day including food and entertainment is an unparalleled bargain at £125.

The Technical Programme

In planning the schedule, Jan Gulliksen, David Benyon and I found ourselves wrestling with those three little letters we know and love. Legend has it that Diaper (Middlesex University) and Thimbleby (University of Swansea) started this little ball rolling at Leeds for HCI2004 with "What does the I stand for, anyway?" *Interface*, *interaction*, *integration*, *infiltration* and increasingly dubious suggestions saturated the chilly Yorkshire dawn. In the more temperate climes of E-burg we now present three separate narrative streams for you to follow and hyperlink between. As ever, bits from one stream could appear in another, but we divide loosely into the Human scale, the larger Cultural Context, and Interaction at the Interface. You'll find a session in each throughout and, only occasionally, two in parallel.

Give me an H!

The Human aspect gets an early emphasis on Wednesday morning with two parallel sessions, one a tablet/tangible/teenage theme, the other needs elicitation. Fernaeus & Tholander (Sweden) discuss collaborative design using tangible interaction for children, while Read (England) exposes usability flaws in digital ink for Tablet PCs for the same audience, identifying new opportunities for this emerging technology. Mohamedally et al. (England) use Tablet PCs to mediate users' needs, describing tools that both permit lo-fi prototyping



Tom McEwan

and allow designers to elicit knowledge from this process. In the parallel session, Strøm (Denmark, in the first of two full papers) contrasts the usefulness of stories and scenarios for software developers to listen to users' voices. Then Lumsden et al. (Canada) provides timely guidance on effective use of online questionnaires. The session closes with two short papers on the effectiveness of usability inspection methods. In the afternoon session, Clerckx et al. (Belgium) investigate how the designer can keep in mind the user's context, while Lonsdale et al. (England) consider awareness as well, in this case of the user's location in a museum gallery space. Haywood & Cairns (England) also look at interaction in museums, focusing on engagement and learning for children.

On the Thursday, the Human aspects are reflected in the Bertelsen panel already discussed, while in the afternoon Mirel et al. (USA) look at how experts actually use online models to carry out knowledge work and advise and create policy in e-Government. Public sector usability returns with a case study from Wong et al. (England) on the fitness for purpose of a public information kiosk for those most at risk in society. Some of these issues resurface in Renaud's (Scotland) study of visuo-biometric authentication for older users (which, with luck, all of us will become one day). On the Friday morning, six short papers on aspects of human capabilities complete this stream.

Gimme a C!

Zooming out to check out the greater Cultural and Contextual factors takes us to the very edge of our bigger picture and makes us focus on the macroscopic. Wednesday morning opens with trust, social networking and emotion (all, admittedly, as much H as C!). Riegelsberger, Sasse & McCarthy (England) examine the relative richness of different interaction media, in this case looking at the degree of trust in advisers' expertise. Social network analysis is intrinsic to Bonhard & Sasse (England) with an HCI approach to the design of recommender systems. Two short papers conclude the session, taking an emotional look into the future, focusing on empathy/enjoyment and facial thermal points respectively.

Preparation for HCI Careers is the afternoon session with Beryl Plimmer (New Zealand) and "A Computer Science HCI Course" followed by four organisational overviews of the HCI research/teaching groups at Limerick, Open, Manchester and Napier Universities – an interesting follow-up for Tuesday's Educators Workshop. Thursday morning has a global Context. Bark et al. (Norway/Sweden) study which techniques Nordic HCI practitioners actually use, and how useful they find each. Smith et al. (England/Sweden/Ireland) reach further afield – to India, and reflect on the evolutionary state of HCI there and the partnerships that foster development. Chen et al. (USA) literally track HCI's own evolution and relationships within itself, with a citation analysis of a selection of HCI channels. In the afternoon the Industry Day short paper session continues the international Cultural exploration.

On Friday morning, three papers linked by the theme of cultural dimensions complete this section. Emotion and values are central to Dormann's (Canada) analysis of web design, in locating homepages from different countries along Hofstede's

MAS dimension. Strøm's (Denmark) second contribution compares interaction design decisions made in a low-income traditional country and in a high-income developed one, and identifies how to take different cultures' views of privacy and honesty into account. Ford & Kotze (South Africa) conclude this section by finding limitations in cultural dimensions and identifies additional variables to take into account.

Gimmmeee an I!!

In many ways the I reflects our home territory, the areas that other sub-domains of information and computing technology yield to us – Interaction with the Interface.

On Wednesday morning, Raisamo et al. (Finland) kick things off in a haptic way, contrasting detection thresholds for mouse and trackball, varying both frequency and magnitude of vibration for feedback. Jetter et al. (Germany) introduce HyperGrid – an extension of existing table visualisations. The navigation of interaction space continues with Hansen et al. (Denmark) and MIXIS, turning a mobile phone with camera into a 3D navigation device. In the afternoon, Naz Awan & Stevens (England) contrast the effects of static and animated diagrams in learners overestimating and underestimating their acquired knowledge. Things get more tangible with Jacucci et al. (Scotland) who find creativity in exploiting constraints in children's use of a tangible interface in video authoring. Two novel short papers widen this session – second generation HCI from Thimbleby fils et père (Wales) and Looser et al. (New Zealand).

On Thursday morning, Juvina & van Oostenberg (Netherlands) find gender differences in visual and auditory modalities for navigation support and Tzanidou et al. (England), analyse the visual in web navigation with conclusions for web design and e-commerce. Two short papers on affect finish this session. Interface components are the theme of Thursday afternoon. Joshua Savage & Andy Cockburn (New Zealand) show that automatic zoom and scroll is preferable to manual control of each. Hürst et al. (Germany) then propose a new slider-based user interface for searching and skimming speech documents while Frauenberger et al. (England/Austria) also focus on auditory interfaces, to demonstrate mode-independent patterns of navigation. Friday morning's short paper session on a variety of interface and interaction issues closes things out.

What's that Spell?

Those of you who queued in the midnight hour for the Half-Blood Prince will know only too well the spells that bewitch visitors to Edinburgh...

What's that Spell???

Sorry, losing the plot here...

"HCI is what that spell!" HCI! HCI! HCI! See you in Edinburgh – opening fireworks are on Sunday 4th.

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Is HCI in danger of spiralling out of control?

The field of human-computer interaction is bursting at the seams. Its mission, goals and methods, which were well established in the 1980s, have all greatly expanded to the point that 'HCI is now effectively a boundless domain' (Barnard et al., 2000, p221). Everything is in a state of flux: the theory driving the research is changing, a flurry of new concepts are emerging, the domains and type of users being studied are diversifying, many of the ways of doing design are new and much of what is being designed is significantly different. Although potentially much is to be gained from such rapid growth, the downside is an increasing lack of direction, structure and purpose in the field. What was originally a confined problem space with a clear focus that adopted a small set of methods to tackle it – that of designing computer systems to make them more easy and efficient to use by a single user – is now turning into a more diffuse problem space with less clarity in terms of its object of study, design foci and investigative methods. The move towards greater openness in the field means that many more topics, areas and approaches are now considered acceptable in the worlds of research and practice.

A problem with allowing a field to expand in this eclectic way is that it can easily lose its coherence and spiral out of control. No one really knows what its purpose is any more or what criteria to use to assess its contribution and value to both knowledge and practice. For example, among the many new approaches, ideas, methods and goals that are now being proposed, how do we know which are acceptable, reliable, useful and generalisable? Moreover, how do researchers and designers know which of the many tools and techniques to use when doing design and research?

Why the explosive growth in HCI?

One of the main reasons for the dramatic change in direction in HCI is the reaction to the array of new challenges confronting the field. The rapid pace of technological developments in the last few years (e.g., the internet, wireless technologies, handheld computers, wearables, pervasive technologies, tracking devices) has created many opportunities for augmenting, extending and supporting user experiences, interactions and communications. These opportunities include designing experiences for all manner of individuals (and not just users) in all manner of settings doing all manner of things. The home, the crèche, the outdoors, public places and even the human body are now being experimented with as potential places in which to embed computational devices.

Furthermore, a range of human activities is now being analysed and technologies proposed to support them, even to the extent of invading previously private and taboo aspects of our lives (e.g. domestic life and personal hygiene). A consequence is that 'the interface' is becoming ubiquitous. Computer-based interactions can take place through many kinds of surfaces and in many different places. Radically different ways of interacting with computationally based systems are now possible, ranging from the visible, of which we are conscious (e.g., using a keyboard with a computer monitor), to the invisible, of which we are unaware (e.g., our physical movements triggering toilets to flush automatically through sensor technology).

What are we doing?

In an attempt to keep up, and appropriately deal with, the new demands and challenges, significant strides have been made, in academe and industry alike, towards developing an armoury of methods and practices. Innovative design methods, unheard of in the 1980s, have been imported and adapted to study what people do in diverse settings. Ethnography, informant design, cultural probes and scenario-based design are examples of these. New ways of conceptualising the field are also emerging. For example, usability is being operationalised in a range of user experience goals (e.g., aesthetically pleasing, motivating, fun) in addition to the traditional set of efficiency goals. The term 'interaction design' is gaining popularity as a way of focusing more on what is being done (i.e., designing interactions) rather than the components it is being done to (i.e., the computer, the human). This more encompassing term generally refers to:

the design of interactive products to support people in their everyday and working lives (Rogers et al., 2002, p.6).

New paradigms for guiding interaction design are also emerging. The prevailing desktop paradigm, with its concomitant GUI and WIMP interfaces, is being superseded by others, notably ubiquitous computing ('UbiComp').

What else do we need to do?

Researchers need to take stock and reflect upon how the rapidly expanding field of HCI can be sensibly managed and framed. To prevent it turning into an anarchic state, where anything is possible, a core set of fundamental challenges and questions need to be outlined. These should specify the boundaries of and identify the core themes within the field. As part of this enterprise, meta-reviews are needed that can lead to generalisations and guidance. A major rethink is also required of whether, how, and what kinds of theory can be of value in contributing to the design of new technologies (Rogers, 2004).

Given the variety of people now involved in the design of an increasingly diverse set of interactive products and user experiences, the development of new research and design languages is also pressing. This, however, is no easy task. It requires determining which of the new terms, metaphors, and other abstractions are useful for articulating design and research concerns – and, importantly, which ones different groups see value in and feel comfortable using. The practice of interaction design would greatly benefit from further research – especially an analysis of the different discourses and forms of representations that are used, together with a better understanding of the tradeoffs and numerous decisions facing designers as they seek to harness the ever-increasing range of technological possibilities. To prevent the 'cool ideas' and 'seat of the pants' approach from becoming accepted practice we need to ensure that the design and evaluation of new user experiences and interfaces can be guided by up-to-date principles and be grounded in a body of relevant knowledge.



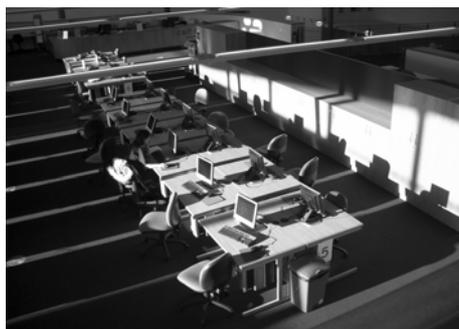
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Yvonne Rogers is a co-author of the internationally renowned textbook called *Interaction Design: Beyond Human–Computer Interaction*. She is interested in new paradigms and theories for HCI, especially in the areas of ubiquitous, pervasive and tangible computing. Her research focuses on augmenting everyday learning and work activities with interactive technologies. In particular, she designs a variety of external representations, including dynamic visualisations, virtual environments, multimedia and augmented reality, to support more effectively 'external cognition'.

Yvonne joined Indiana University in 2003 as a professor of Human–Computer Interaction and has a joint appointment in the school of Informatics and the school of Library and Information Science. Previously, she held the position of professor in the School of Cognitive and Computing Sciences (now the Dept of Informatics) at Sussex University, UK, where she co-founded, with the late Mike Scaife, the Interact Lab.





Tools of inspiration

Accessibility tools are not the most glamorous of playthings. More often than not, you make do with a toolbar across your browser; a set of guidelines, or, at best, heuristics; and, if you are lucky, a screen-reader. To the uninitiated, they appear highly technical and unwelcoming. Someone said to me recently it took working alongside a person with very little sight for a couple of hours to transform the meaning of the great wad of guidance she'd been handed about making websites accessible. Suddenly it seemed like an important venture, rather than a test of patience.

Given that many designers see accessibility as a technical chore, not an opportunity for creative inclusive design, it is a shame more do not have the chance to work directly with users for whom access might be an issue. However, most product testing is carried out with users of working age, recruited by market, not for the range of their characteristics. And not that many designers get to sit in on user testing anyway.

With this in mind, the UTOPIA project team, led by Alan Newell of Dundee University, decided to build tools of inspiration. If designers do not go to users, let the experience of the users come to them. UTOPIA (Usable Technology for Older People: Inclusive and Appropriate) is a Scottish Higher Education Funding Council funded project, involving the Universities of Dundee, Napier, Glasgow and Abertay Dundee, researching the relationship between older people and technology. Newell and his team were charged with convincing industry that it is important to consider older people when developing new products, and to educate them in how to do so.

Newell describes working in collaboration with an industrial consultancy firm developing a web portal for older people. "It was only after the engineers had taken part in an evaluation study of one of their prototypes with older people that they realised the full impact of the challenges. This I called the 'Road to Damascus' event. I wanted to try to reproduce it in a cost effective manner."

During the UTOPIA project, the team became increasingly aware that the current methods used to convey this message were not up to the job.

Their solution has been to make video scenarios that capture the experience of a range of older people in dealing with technology. There is now a CD and a DVD version of three short tales, known as the 'Utopia Trilogy'. Each tale deals with a set of issues in a realistic way, played by actors, but drawn from the experiences of people interviewed and observed as part of the project. The first, for instance, deals with a couple's desire to hook up a web camera so that they can see pictures of their grandchildren. The woman leads, while her husband makes helpful suggestions from the chair. In the end they are defeated by the antiquity of their computer and the need for a USB port to plug the device into. It's a story that many would recognise and not exclusively as a preserve of older people. Nonetheless, the age of the system, the tentativeness of the owners accompanied by a certain naivety – the woman doesn't know that the monitor is not the computer as such – are not untypical of people in this age-group and make for particular

problems. Two further stories on the disc deal with similarly human aspects of using mobile phones and email.

"It is designed to change the mind-sets of designers so that they become truly empathetic to the needs of older people, rather than simply follow guidelines, or just pay lip service to inclusive design," says Newell.

A department of applied computing does not seem a likely incubator for video stories. But an earlier project on home monitoring systems at Dundee had used narrative videos successfully to facilitate discussions with older people on the requirements for such monitoring technology. And Newell's knowledge of theatre reassured him that this medium could be used to convey messages in very effective ways. Through links with the local Foxtrot Theatre Company, Newell has seen firsthand the power of theatre in professional training and in facilitating discussion on sensitive issues. "It thus seemed that a version of this was a very appropriate way of communicating these messages to designers." And a collaboration with Foxtrot seemed an appropriate way forward in executing the plan.

Maggie Morgan was drafted in as script writer. She founded Foxtrot in 1992, to concentrate on Forum Theatre (where the emphasis is upon participation and community consultation, rather than performance for entertainment alone). She brought with her experience from the previous video work at Dundee and a range of productions aimed at older people. Previous scenario work included a commission from Age Concern Scotland to tour 'Breaking the Silence', a set of three interactive scenarios focusing on abuse of the elderly, playing to audiences of both professionals and older people.

Morgan stresses the value of thorough and accurate research with experts in the field so that scripted material rings true. "If you get even small factual details wrong, the illusion of reality is shattered. I spoke to a number of the older volunteers involved in the Utopia project as well as the staff, read and viewed a great deal of material, visited one of their computer groups..."

"There was a great deal of material to work from, with each Utopia team member working on different aspects of technology such as learning to work with computers, including use of the internet and email: playing computer games: use of mobile phones: using a computer based navigation aid. From all this information, the most important general principles and difficulties had to be distilled, then the different threads woven into the tapestry of three different stories."

After a great deal of discussion, decisions were reached on the content of the scenarios and what they were to demonstrate. Morgan turned her attention to producing further drafts of the script for the Trilogy. Her priorities were structure, tight scripting and good characterisation. The process of dramatisation was also supported by the hiring of experienced professional actors: "in order to mount a good performance in a short time and to achieve the 'suspension of disbelief' required from the audience", she says.

"Budget restraints demanded that our locations were local, which was not a problem. The budget meant also that the three scenarios were shot in three days. This made the timetable very tight but we kept to it by myself and the film director planning meticulously beforehand and by using a slightly more

theatrical style of filming, rather than a more complicated filmic style, which would have taken at least twice as long to shoot, let alone edit. Each day was a long one for the crew, though careful timetabling of the actors kept costs down. Also the weather was kind for the outdoor shots!"

Morgan says that a larger budget might have improved the final product. It is hard for the team to put a finger on the exact cost of the work because so much was handled in-house, but the amount was modest. "Taking more time over the shoot would have produced a more artistic video, for example. As script writer, it would have been beneficial for the development of the script to have a mid-way session with an invited audience where the actors, using scripts, acted out what had been developed so far. Comments from the audience, researchers and older participants in the project, could have added to or sharpened up the scripts. In the end, however, we had to select the main points the video was trying to get over, in order to encourage discussion amongst designers, etc. Trying to achieve everything in some short scripts would not have worked."

The dramatic form came with its own problems for an academic department, though. Anna Dickinson is one of the researchers who worked with Morgan on the collaboration. The process of translating ideas and experiences into a video was quite new to her.

"I found some of the process interesting. We tried to approach the development as an iterative, educational dialogue between us (the researchers) and the creative team. The idea was to pass on our experiences working with the user group and to give as wide a view as possible of the experiences that people have learning to use computers. Perhaps some of the aspects that we had felt were relevant became lost in the creative process because they lacked dramatic interest. One aspect which perhaps this was true of was the successful computer user. There are many older people who are extremely successful computer users and we wanted to show this when we initially considered the idea."

The difference in priorities, language and ways of working is something that everyone involved in making the video acknowledges. Newell points to the initial communication difficulties between the researchers and the scriptwriter, while Morgan comments that it proved immensely useful that one member of the Utopia team was a filmmaker as well as an academic researcher, speaking both languages.

"The process itself – of a dramatist working with academic researchers – sort of paralleled the difficult process of technologists and designers trying to communicate with older people who were new to technology, and vice versa. Perspectives, expectations, past experience, an understanding of each other's values and, of course, language were different. It was a fascinating if sometimes frustrating process."

And Newell, reflecting on the learning gained, concludes: "Ensure that all the parties in the development are aware of the various agendas, and the tension between the artistic requirements of a rich and rewarding story and the technological requirements to convey particular important messages."

He is now at the point of publicising both the Trilogy and the methodology, so discussion of the learning is germane.

"We've obtained good feedback on the effect of the Trilogy from both designers and students. This, however, is the first example of such a methodology – and some respondents commented that it was a bit slow in places. We thus need to refine the process so that the final outcome is 'tighter', and covers a greater range of interface challenges presented by older people."

As well as target audience, another group were consulted on the outcome too: "I cared very much about the people we were representing by making it and I was very anxious that they didn't feel we had misrepresented them," says Dickinson. "Their reactions to the videos have been very positive, however."

And showing it to a room full of designers, I found that it largely does what the team hopes. The audience was appreciative; commenting that it took a holistic approach to the problems associated with technology and had been framed in contexts of use, making it informative and approachable. Ironically, they were concerned that the issues presented affected a wider population and that showing them as the preserve of older people might marginalise them. They also felt that the scenarios present difficult problems for designers to solve. But that is the point really – that there is an awful lot to think about and that thinking about how much is a good start.

Maggie Morgan sums it up. For her, the exercise was quite personal: "I am in my early sixties, and my introduction to computers in recent years reflects similar experiences to those shown in the video. Use of the word processor has transformed my regular day-to-day work. On the other hand, doing anything new or slightly different seems like going into a minefield. I still remember my great pride and sense of achievement when I first succeeded in buying something via the net."

Making that fear, frustration and joy more widely available can only be good for design.

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This article was previously published on www.usabilitynews.com on 14 March 2005.



Ann Light is best known as editor of *UsabilityNews* and, when not busy with that, consults on communication strategy, marketing, and usability. She is also a visiting research fellow at Queen Mary, University of London, and is part of the HCI community that seeks to introduce insights from the arts and humanities into digital product design.



Twenty years of HCI – then and now

Recently, I was asked to give a talk on the history of speech interaction with computers; my first introduction, some forty years ago, to the fascinating theory and practice of human-computer interaction. So, with an historical frame of mind already established while I did the research for this talk, my eye was taken by the invitation to write something about the past twenty years in HCI. So here is my contribution from the perspective I had in 1985.

In 1984, I was seconded from ICL to the Alvey programme, a £350M government and industry-funded collaborative five-year strategic research programme that was to enable the UK IT industry to compete with the US and the recently announced Japanese Fifth Generation Computer Project. The programme funded research into the following sub-programmes: Very Large Scale Integration (VLSI), Software Engineering (SE), Intelligent Knowledge Based Systems (IKBS), Man-Machine Interface (MMI), and Communications.

My role was to manage the Human Interface (HI) part of the MMI programme led by Chris Barrow, which also included research on flat panel displays, speech processing, and image processing. My indoctrination into the problems that were going to be part of my working life for the next two years started the week before I joined. I was invited to an MMI workshop that was going to establish the priorities for the MMI programme, in much the same way that ESPRIT was doing in Brussels.

On the first evening, Brian Oakley, the director of the Alvey programme, spoke some challenging words to the MMI community about what was required, especially of the social scientists who were part of the multi-disciplinary gathering. As many of the participants told me, they felt that he was being too harsh in his call on them to leave their ivory towers and get stuck in to practical problems (as I remember!), but his views were not entirely inappropriate. As the programme got off the ground, I sensed that part of the research community felt that HCI was now an established field that could pursue an academic discipline, with erudite papers on issues that were potentially relevant but probably too far ahead of their time.

However, the first issue was to get the MMI Strategy, especially the HI part, agreed by the Alvey Board and the Steering Committee, a number of members of which were hostile to what looked like 'soft stuff' and would clearly have liked the money for their own money-consuming high tech interests. After much arguing, we finally got the strategy approved and issued calls for proposals. Then started the challenging task of assessing multi-disciplinary research proposals with a team largely composed of experts in the individual disciplines making up HCI.

One consequence of the cross-disciplinary teams was that members found it, individually, very easy to reject a proposal on the grounds that there was 'something wrong' from their perspective. It did not take long for another expert to jump in from their perspective and soon the proposal we had been trying to encourage to gain new ground was not gaining the support we required. The industrial components of proposals were perceived to be weak, but as Chris Barrow repeatedly told the Alvey Board and the research community, we were

trying to build a body of expertise where it did not exist. We were very clear that the potential benefits of computers would not materialise unless they came out of the air-conditioned 'temples' where many of them then resided, and that making computers easy to use was going to be an important factor in this, just as reduced cost and increased computing power were going to play their part.

We were also under attack from another quarter because there was a perception that HCI research was academically biased. True, the academic/industrial balance was more heavily academic than the original plans called for, but it was no worse than parts of the Software Engineering or Intelligent Knowledge-based Systems sub-programmes. Fortunately, the VLSI programme was heavily biased towards industrial involvement so the Alvey programme was able to meet its financial constraints imposed by the funding bodies.

The point of my story is to remind ourselves of the heavy technological bias of advanced computer research at that time and the perceived overly academic bias of the HI programme. This was despite the fact that UK IT companies (remember them?) were telling us that a significant part of the effort in software development went into that part of the software concerned with supporting the interaction with the users in their multiple forms.

The comparison with the US was startling. I went to CHI in San Francisco in 1985 and was struck by the high balance of industrial to academic participation. Approximately 80% to 20% if I remember correctly. At the first HCI conference, the proportions were almost exactly reversed. In the US, there were job advertisements for user interface designers and usability specialists; in the UK the job ads were for research assistants to work on Alvey-funded research projects! Industry was not yet interested or ready for increased attention to the Human Interface.

One of the difficulties we faced at the time was the absence of business-related case studies as to why attention to the user interface and considering the human factors were worth doing. How things have changed. Since then the literature has grown considerably. There are readily available books as well as research papers defining the business benefits of a user-centred design. Now the majority of software suppliers subject their new products to usability testing as part of the design process. Many software application producers do the same, either in their own labs or using the services of the independent user-centred consultancies that have also blossomed over the past twenty years in the UK as industry has realised user-centred design makes good business sense. The job ads in the UK for people with HCI skills are no longer confined to academia. HCI is for real.

So I can look back over the past twenty years and see that HCI has become an established part of mainstream design practice. I can also see a flourishing community of professionals in this vital area, both important objectives that we had in mind twenty years ago. I am not claiming that the Alvey programme, or even my part in it, were significant, rather that the vision that drove us forward has become largely realised. Looking forward, I can now see an interesting parallel between



usability and accessibility that Gilbert Cockton has been writing about in recent issues of *Interfaces*.

We hear much about the ageing population and the likely implications for health and welfare services, the pensions crisis, the need to employ more older people, etc. Whilst the voluntary sector and government (at national, regional, and local levels) are looking at the issues, business so far seems largely unaware of the potential opportunities an ageing (and largely wealthy) population represents. One of the approaches to meeting the needs of older users is via inclusively designed products that extend the size of the addressable market for products by making them usable by a larger number of people. After all, the majority of older people are consumers of many of the products and services that the rest of the (diminishing) population also purchase.

However, in researching a book on the customer needs of Britain's ageing population (Metz and Underwood 2005), my co-author and I were struck by the lack of business cases showing how companies had made a commercial success of addressing older people. Yes, we've all heard of Saga, but that business model is not appropriate for all companies. Even companies that have launched successful inclusively designed products do not advertise the resulting business benefits (Underwood 2005). Does this lack of business cases sound familiar? To me, it is analogous to the situation with user-centred design twenty years ago. We could usefully learn from that experience and ensure that the business benefits of inclusive design are researched and published as actively as the

techniques themselves. That makes an interesting challenge for the future as well as responding to continuing technological advances.

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As the article shows, Michael Underwood has long been interested in human-computer interaction; his PhD in speech synthesis from the University of Keele was amongst the first in the UK. For over 25 years, he was involved in research and advanced development in man-machine systems for ICL, STC and Nortel. After becoming an independent consultant, he spent three years as an expert to the European Commission advising on technology research for disabled and elderly people in the TIDE Office in Brussels. After returning to the UK, he became involved in the Office of Science & Technology Foresight initiative addressing the implications of an ageing population. As a result of this experience, Michael with two other partners set up Population Ageing Associates to help government, industry and the voluntary sector work out the strategic implications of population ageing. See www.populationageing.co.uk and www.oldericherfitter.org.uk for more details.

WANTED: Student Representatives

The British HCI Group is keen to recruit students to join the Group's executive committee as student representatives. You are, ideally, a new postgraduate student working for a PhD or about to start a master's degree: it is important that you are in a position to commit to the Group for at least a year, ideally two. Student membership of the executive is the ideal way to get a close-up, inside view of HCI in the UK and, increasingly, abroad as we develop our links with international organisations. If you want to pursue a career in HCI, this is the place to be!

As a student representative you will be responsible for:

- Representing the student body of the Group to the committee
- Generating ideas (with other students?) to improve the quality of the student package
- Acting as a voice for student issues on the BHCIG Executive

It is in the nature of the Executive that your personal suggestions and initiatives are encouraged and will be enthusiastically received.

Each student representative will serve on one of the Group's five committees (Membership, Communications, Events, Research, and Education & Practice) and, as well as supporting that committee's chair in the day-to-day running of the committee,

you will have the chance to extend or develop an interest in one of the five areas.

Reps should be prepared to commit to attend up to four meetings of the committee per year, plus other contributions via electronic communication and to provide input into the Group's products and services. Meetings are held all around the country: all expenses are paid for, but all committee members' time is contributed on a voluntary basis.

Interested?

To apply send a CV and cover letter or email stating which two committees would be your first and second choices, and the experience or qualities that you have that support your choices.

Please apply by email or post.

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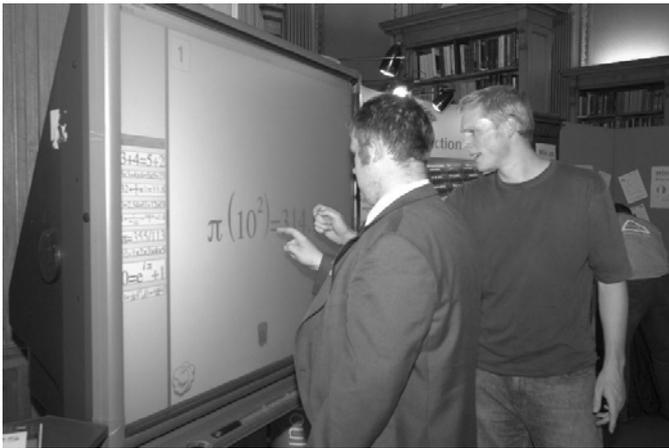
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Kids swarm over leading edge science

The Royal Society Summer Science Exhibition took place on 4-7 July 2005. Swarms of enthusiastic school children descended on the Royal Society to quiz leading scientists about their work. The exhibitors were selected to showcase the UK's cutting-edge science and technology research. Human-computer interaction had a good showing with four of the 24 exhibits having a major HCI element.

Will and Harold Thimbleby of the University of Wales, Swansea demonstrated their calculator (<http://www.cs.swansea.ac.uk/calculators>). It takes a completely different approach to existing calculators, which make the user constantly rework a problem, approaching it from different directions just so that it is in a form suitable for the calculator. The Thimblebys' calculator instead makes use of handwriting recognition software that is animated to a correct equation. Whatever you write, the system fills in the rest of the equation. It moves the emphasis from using the technology to understanding the maths. If you are interested in seeing it, it will be presented again at HCI2005 in Edinburgh in September.



Weapons of Maths Construction

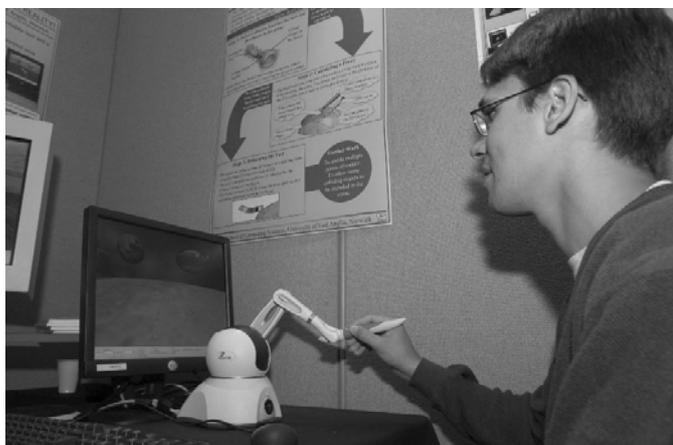
Another HCI-related exhibit was Sodarace (<http://www.sodarace.net>). It is a joint project between digital art, learning and play specialists Soda Creative Limited, and Queen Mary, University of London. It is based around the BAFTA

award winning Sodaconstructor package that allows drawings to be made from springs, muscles and masses that then automatically animate in accordance with the laws of physics. Once 2D robots have been drawn they can be raced against other robots over 2D terrains, including those created by artificial intelligence programs. The system is freely available online and now has over 130,000 registered users. The online element is a fascinating example of the power of the web to build communities. The Sodarace community has thriving discussions on issues such as AI, physics, astronomy and of course their own inventions. Intriguing developments of the virtual community include the specialist language that has developed to characterise discoveries in the virtual world and the way some of the kids involved have started to specialise: for example just making motors for others to use.



Build and race 2D robots online

Two of the stalls concerned haptic feedback. Andrew Day and Stephen Laycock of the University of East Anglia demonstrated their virtual reality haptic feedback system (<http://www.cmp.uea.ac.uk/Research/cgp/research/haptics/index.shtml>), which uses force feedback devices from SensAble Technologies. The system allows the user to move objects in a 3D virtual world, but in a way that means you feel the forces when the virtual objects touch. Their novel focus is on deformable tools. They have developed programs that calculate the



Receiving force feedback when a virtual flexible tool impacts with another object.

forces exerted as a flexible tool hits a surface, bending as it collides. These forces are fed back to the haptic device which is what you very realistically feel as you probe the virtual world.

A team from Imperial College London were demonstrating surgical robots. One was a telemanipulator robot that makes a similar use of haptic feedback to allow surgeons to remotely



Surgical robots use haptic feedback to enhance dexterity

feel instruments pressing against body tissues. Surgical robots have a major advantage over direct surgery in that they eliminate hand tremor and restore the dexterity that's lost in traditional keyhole work. Also on the prowl around the exhibition was a remote presence robot. It contains a screen, camera and microphone. The idea is that it is controlled remotely over the Internet by doctors. It allows them to have remote real-time two-way conversations with patients.

A highlight for me was when Jose Natalini, a computer scientist at the Universidad Nacional del Sur, took control of the remote presence robot from his office in Argentina. Natalini guided the robot to the Sodarace stall so that he could have his caricature drawn remotely by the Artificial Intelligence cartoonist program (<http://www.dcs.qmul.ac.uk/cs4fn/alife/talktoon.html>) there.

The AI cartoonist program was developed by a team of undergraduates at Queen Mary and is based on the Sodaconstructor software. As with a human cartoonist, it identifies non-typical features of a person's face and exaggerates them... This interaction must be some sort of world first in human-computer interactive art: an AI sketching a cartoon of someone remotely via the telepresence capability of a robot!

Paul Curzon

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This remote presence robot enables doctors and patients to converse in real-time.

Photographs used by permission of the Royal Society. Further images of the event can be seen at <http://www.royalsoc.ac.uk/exhibitors/sse05/>



Grittiness in visual image and in motion

As of late Red Hat has invested significant effort toward improving Linux's underlying graphics infrastructure. The initial impetus came from engineering. Engineering's motivation to invest in graphics infrastructure could be roughly summed up by: "our graphics stack isn't nearly as cool as competitor X", in this case Mac OS X. So at this stage we, as designers, were commissioned to come up with a reason for improving the graphics architecture.

Small improvements in the physicality of computer interfaces are like getting just the right textured rubber on the grips of a tool: it can easily make the difference between something that's merely functional and something people love. Double-buffering of drawing events, for example, created windows that seem more tangible since they didn't flicker, go blank, etc. Systems that used double-buffering just felt a lot better. We were looking for approaches that, like double-buffering, not only improved visual appearance but the 'feel' of things. Getting the feel right is crucial in reinforcing a mental model wherein computer objects are tangible constructs.

We finally hit upon a theme that seemed to yield improvements in both the aesthetic appeal of the desktop, as well as interaction gains: make the desktop a little grittier. Computer environments tend to be sterile, eternal, unchanging and perfect. We wanted things to feel a little dirtier, more varied, more organic. Two improvements we've been working on in this vein are 'wobbly windows' and 'dynamic themes'. Both are straightforward concepts that produce marked improvements in aesthetic appeal.

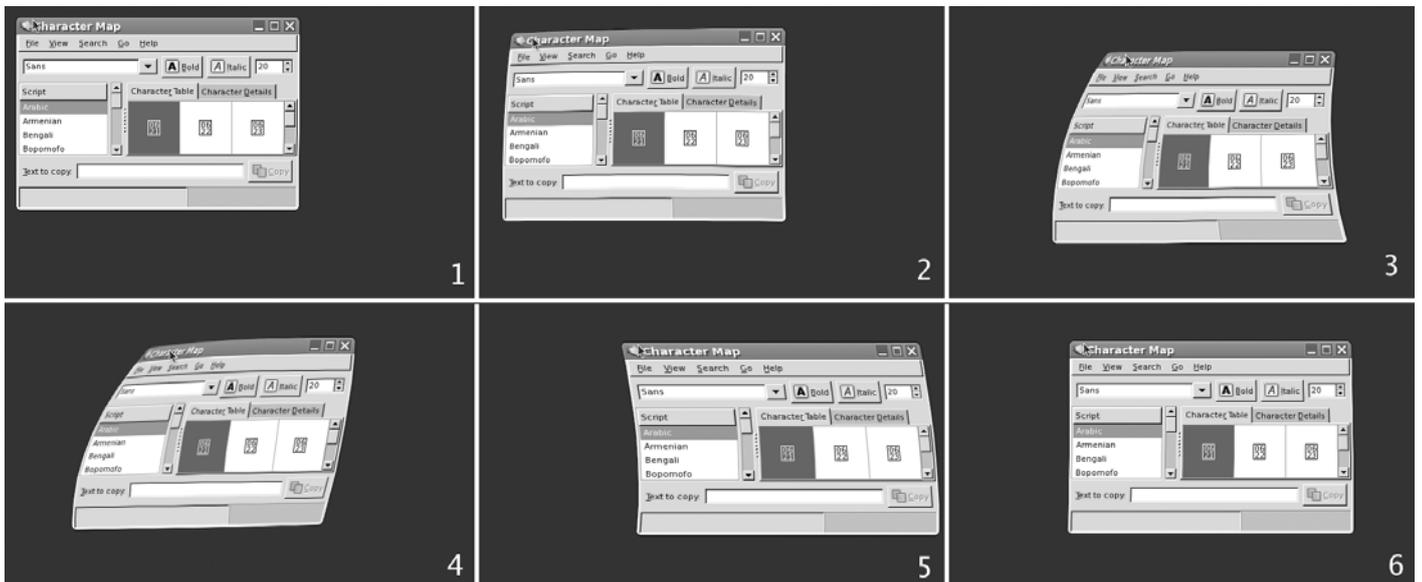
Wobbly windows

Since people do not live inside a world of static timeslices, we wanted to consider how to do this in motion, not just as a 'screenshot'. Exeunt omnes, enter wobbly windows. Wobbly windows are our first foray into a technique we hope to apply

more widely in our interfaces. It's really rather simple: when you move a window it's not completely rigid and flexes as the segment you are gripping accelerates more quickly than the rest of the window. We were careful to ensure that the point under the mouse remains constant, and while we have not conducted strict experiments, observations of users suggest that the wobbly windows effect does not appreciably slow down window movement operations. We have observed people moving windows more frequently (even over long term use where one might expect the novelty to have worn off), as moving a wobbly window produces a pleasant reward.

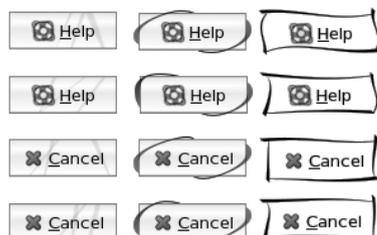
Naturally one can take metaphors too literally, importing annoyances and constraints. We toyed with including some degree of inertia in the windows, so when they were released they would continue to move across the screen and slowly decelerate. While this did allow some cute behaviours like 'throwing' windows across the screen, it mostly just made it take users substantially longer to move windows since they had to wait for them to settle before releasing the mouse button.

Windows or other moving elements feel a lot more recognisably physical when this effect is applied. We suspect this is because, lacking other effects of embodiment in the physical world (texture, weight, etc), going out of our way to provide one or two cues (besides being visible) that the object is beholden to standard laws of the physical world provides a manifestation that this is a 'physical object'. We're not trying to claim that being rigid is somehow un-physical. Certainly there are many rigid objects in the world. Still, surprisingly few are rigid in all dimensions, and a large fraction of rigid objects are technology goods of some sort. When you move a hardcover book it does flex a little. Probably not visibly, but its very much detectable by feel. Of course, since we can't convey feel directly, we've chosen to portray a rather visually exaggerated flexibility in our prototype.



A window is dragged rapidly with wobbly windows enabled. The user releases the mouse button between frames 4 and 5, and the window quickly snaps back into shape

Dynamic themes



Buttons rendered using three simple dynamic themes. Despite using relatively constant visual motifs these themes remain unrepeatitive with extended use.

require greater collaboration between artists and programmers since the artist can't just ship a static image to the engineering staff and say "Make it look exactly like this!". So why do this?

On the interaction design front, we've also found promise in seeding the renderers using elements unique to that control. For example, we seed one of our window titlebar renderers using the window's title. The result is that that particular window looks the same every time you see it, and different than every other window. There are some issues left to deal with: its a little strange when a window title changes and suddenly everything looks different. But on the whole having objects look unique and consistent across multiple viewings is a substantial improvement.

More important however is the increased artistic possibility raised by dynamic themes. Our experience is the most visually stunning themes begin to irritate users quickly in actual use, even well thought out 'usable' themes. We attribute this to the repetition of pixel-identical visual elements. In most systems controls are rendered by composing a series of statically rendered visuals. For example, you have the static image for the button's outer bevel, the static image for scrollbar's drag bar, etc. Because these pixel-identical controls appear everywhere, users begin to notice visual elements that stand out in the controls very quickly. Its like the repeating background textures found in early computer systems. Repeating something over and over and not having it look repetitive is tricky!

Put a tiger stripe across a button and it looks good once, but once you see the same tiger stripe on twenty visible buttons, it gets old quickly. Trees are beautiful partly because they're so intricate. But if every tree in the world was exactly the same, it would probably be annoying rather than beautiful (People would probably respond by destroying trees: clear-cutting giant tracts of forest... oh wait...). This sort of perfect duplication is very industrial, very computer-y.

Dynamic themes open up a lot more artistic possibility, from a hand-stroked look, to non-square control shapes, to bright colours. It's hard to create a visually appealing and usable theme. It's doubly hard to create one that doesn't tire quickly. Our experimentation with dynamic themes suggests that they can be a lot more wild without becoming irritating to people. The freedom from this additional constraint opens up

room for more creativity and variation in computer appearance. If we have to construct software programs from a couple dozen pre-defined Lego bricks called controls, at least the bricks can be interesting!

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Special Theme Issue

Personal and Ubiquitous Computing At Home with IT: Pervasive Computing in the Domestic Space

In this special issue, we are concerned with design of personal technologies for activities that take place in or around the home and make up the social fabric of that home when the 'work' of family life is abstracted out. We are interested in technology design and use for human activity that is not easily conceptualised in terms of 'tasks', or 'goals', and is not necessarily well assessed using traditional measures of use such as 'effectiveness' and 'efficiency'.

Example topics might include (but are certainly not limited to):

- accounts of the particular challenges of studying and designing for domestic activity
- theorising technology in the home
- understanding and supporting phatic activity
- technologies for maintaining a sense of presence in absence when family members are separated by distance
- accounts of the exchange of intimate messages across distance and time
- passing the time pleasantly
- 'decorating' a home using with ambient technology

Deadline for submissions: **October 1st 2005**

see <http://www.cs.aau.dk/~dubois/cfp-puc.html>
for submission formats and further information

<http://www.personal-ubicomp.com/>



Hyperwords

The dream of interacting with information on computers in a richer and more natural way goes back to the very beginning of computing. One way this dream has been expressed most clearly is through the vision of speaking with computers, to have a natural conversation.

This article will attempt to show how we can talk to computers with current computer technology and will illustrate that the action of recognition of the words is not the big problem. The problem is the logic of the grammar and what the computer can be expected to 'understand'.

First, defining the problem. You are reading this in an HCI journal and I am writing in one, so it would be a reasonable assumption, were we to meet in person, that we could have a pretty good discussion on HCI-related issues. We share a knowledge domain and we both understand English. If I were to talk to some of my friends or family members about 'Fitts' Law' and ask them what they thought of the work at PARC vs. the work at SRL, the reply would be something similar to if I'd asked them a question in a completely different language. Shared context, vocabulary, and grammar – a shared discourse – matters when people are communicating, so why should it not when people are communicating with computers?

If I say to my computer: "Henning home", it dials my brother's home number. Pretty much always accurately understood. If I tell my computer: "Tell Henning I'd like to go to the cinema tonight", I will get a little error beep. The phone understands me perfectly only within our shared discourse.

Here is a short 'story' showing what can indeed be done today, with voice and discourse recognition:

Emily Hi I'm Emily. I am off to Norway to talk to a potential new business partner about investing in their organic salmon farm. (Emily steps into a craft)

LiSA the computer voice: Departing London.

Emily I should know a little about these guys first... They sent me the web address to their business... (clicks on web address in email; web page opens)

Emily "SuperSalmon® is Norway's most established organic salmon farming operation"... OK, I know all that... "Located outside Bergen"... Where is Bergen anyway? Computer, show me 'Bergen' in Wikipedia...

Emily (reading the screen): "... second largest city in Norway... and it rains a lot". Must remember not to mention that...

Emily Anyway, back to the SuperSalmon® website.... My contact, Mr Hegland, I should read about him. ...bio (click)... press releases (click)... Oh, way too long. Computer, colour 'Hegland' in strong blue. There you go... Ah, I see Japan! Computer, colour 'Japan' in strong red. (scrolling...) Right, 'Hegland' and 'Japan' on the same line. Ah, he's been to Japan; gotta ask him what he thought of Sashimi!

Emily My colleague Fleur should know about this, I should email it to her, with the current view; 'Hegland' in blue and 'Japan' in red: Computer, mail this page to Fleur. OK.

Emily Back to their website. Production numbers, aha, ok, quality control, yes all very nice, they now exceed EU Organic standards.

Emily Computer, show me a news search on the BBC of 'SuperSalmon®'. Wow, tons of entries. Here's one, from a conference of aquaculture companies in Norway. (page opens) This is too long. Computer, show only paragraphs with 'SuperSalmon'. That's better. Hmm... (reads)

Emily Oh yes! I was going to impress him with my knowledge of Norwegian.... Computer, tell me the translation in Norwegian, of 'salmon'.

LiSA Laks.

Emily Laks? OK, Laks. I can say that.

LiSA You have a message from a potential business partner.

Emily That would be Mr Hegland... (Emily opens the email)

Emily Ah, a reference to sustainable fish stewardship website where SuperSalmon is listed as being rated 'Nor-A1'

(Emily opens the web address the email refers to and reads on the screen)

Emily But what is 'Nor-A1'? Computer, show me search results from Google for 'Nor-A1'. OK, a new local standard. This is worth keeping. Computer, blog about this paragraph. (new window opens, Emily types and talks)

Emily "Impressive information found on the way to Norway. I should be there in a few minutes, hope the place lives up to its billing."

LiSA Arriving Bergen.

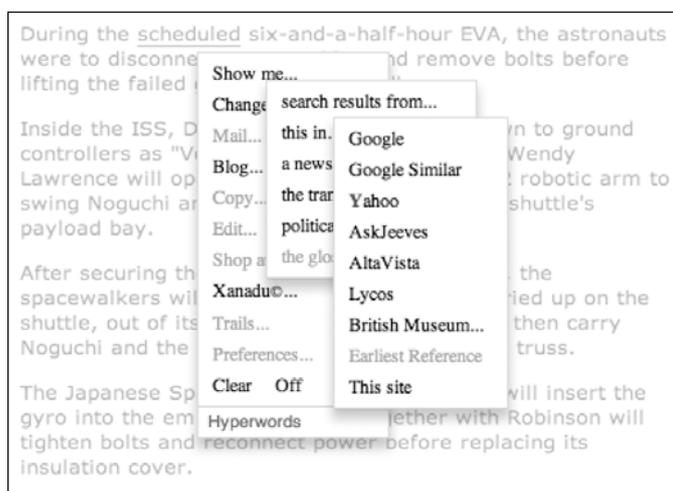
Emily Here we are... (Emily leaves vehicle. I am outside in a big Norwegian sweater to greet her, complete with a clipboard or something, filmed in Norway, of course)

Frode Hello Miss Ballard.

Emily Hello Mr Hegland.

So why does this interaction work? It works because the discourse is tightly constrained. The script is for a short live video/computer animation piece being put together with hyperwords, which incidentally, do not feature any speech recognition.

Before you put down this prestigious journal with a huff, please let me explain: Hyperwords are based on a hierarchical menu. For any word, or selection of text, on a web page, you can display a menu. From this menu, you can choose a top level menu item, such as 'Show me...' and then choose, for example, 'this selection in...' and then 'Wikipedia'. The equivalent spoken sentence would then be "Show me this selection in



Wikipedia". In the script above, the selection (either a single word or a selection or text) was spoken but hyperwords work with textual menus and input from a mouse or keyboard.

The star of the short video piece, Emily, cannot actually say anything so naturally to the computer because the computer cannot understand the context of what she is saying. She can only say things in their shared discourse; in other words, what can be mapped onto the hyperwords menu.

Here are the menu hierarchies that Emily used in the example above. Hopefully, this will give you an idea of hyperwords' current command capabilities. More commands will of course be possible. And there will be an increasing number of usability issues:

Show me... > search results from... > Google / Google Lucky / Google Similar / Yahoo / AskJeeves / AltaVista / Lycos

Show me... > this selection in... > Dictionaries / Dictionary.com / Wikipedia / Answers.Com

Show me... > a news search from... > BBC News / CNN News

Show me... > the translation to.... > English / German / French

Show me... > the glossary definition from the... > site / document / author / user / [Edit]

So that should give you an idea of the capabilities of the hyperwords menu. On the one hand, slowly plodding through levels of menu hierarchies and the capabilities of hyperwords; on the other hand, where you can say all kinds of useful things, provided you have learnt what the grammar and vocabulary of the computer is, what your shared discourse is. This represents the glamorous end, with hyperspeech, and the intro-level end, with the hyperwords menu.

There is one more interaction, and it's the one we are the most excited about: keyboard shortcuts. When you use the hyperwords menu, single characters turn bold and blue of selected menu levels. For example, the 'S' in 'Show me...' turns bold and blue when you select 'Show me...' This means that instead of pointing to the 'Show me...' level in the future, you

can just type in 's' and the hyperwords menu will automatically go there for you. You can do this to navigate the whole menu, allowing you to type in 'ssg' to search Google for example. This is where we feel the real power lies: Quick to learn, quick to execute, with minimal cognitive load. Much quicker than speaking commands. Just not as glamorous.

Please try the live demo of Hyperwords at <http://www.liquidinformation.org>

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Experiences in the field

Usability testing using paper prototypes

Paper prototyping is one of a number of UCD techniques that can be applied early in the development lifecycle to validate or refine a user interface (UI) design, before time and effort is committed to developing it in software. This article describes our experiences of paper prototyping in the development of Tallis, a clinical knowledge modelling platform developed at the Advanced Computation Lab of Cancer Research UK.

Background

Tallis [1] is a suite of modelling tools that enables users (typically clinicians, but not exclusively so) to author, distribute, and execute knowledge-based applications. As is typical of much research-based software, Tallis had grown through a process of accretion and opportunism, rather than being architected from a rigorous requirements specification. Moreover, since it was freely available for research purposes, the emphasis was always on innovation (i.e. implementing the most scientifically interesting algorithm or paradigm) rather than usability *per se*. Consequently, it was not surprising that at some point a lack of emphasis on usability would be reflected in the user experience, and that the ability of Tallis to meet the needs of more demanding users could be compromised.

Consequently, work on a new design began, taking into account the shortcomings of the existing UI and the relevant best practice guidelines (ironically, starting with those at the US National Cancer Institute: <http://usability.gov/guidelines/>). The intention was that this new UI would not only address some of the small (but numerous) UI problems that Tallis was seen to possess, but also fundamentally redesign some of the key elements of functionality that were known to be problematic. However, in so doing, we created a redesign that seemed (at first glance) to be a considerable departure from the status quo.

Inevitably, this had two effects: first, that existing users would be somewhat alienated, since they now had to learn a (relatively speaking) very different interface. (Even though in the longer term we believed they would be better off, try telling that to the busy clinicians whose time is always at a premium!) Secondly, since the UI represented a fairly radical departure from the key interaction elements of the first UI, there were others (including us, to a certain extent) who were unsure if all this change at once was in fact really a good idea at all.

So, how could we be sure that our instincts about this design would be borne out? Well, one strategy would be to simply trust those instincts, and assign our best developer(s) to it. However, with an estimated development schedule of 3–4 months, that seemed a somewhat risky option. What we needed was a technique that would mitigate the risk within a much shorter timescale, e.g. a few weeks. Enter paper prototyping.

Paper prototyping

To borrow the words of Carolyn Snyder [2], paper prototyping is

a variation of usability testing where representative users perform realistic tasks by interacting with a paper version of the interface that is

manipulated by a person 'playing computer,' who doesn't explain how the interface is intended to work.

The advantage of using paper prototyping is not only that it is relatively fast and effective, but also that it provides a way to emulate complex logic without having to write any code. Ideal then, for testing an application such as Tallis.

But as always, life is rarely that simple. For Tallis, we had the added problem that in order to convince the relevant stakeholders (and ourselves, for that matter) that this new UI design really was significantly more usable than the old one, and hence worth the investment of four months' development time, we had to *compare* them side by side. This meant that **both** UIs (old and new) had to be mocked up in paper, even though the first of these already existed in software (well, you *could* compare a design in software with another on paper, but we're not sure that would tell us what we needed to know).

Building the prototype

So we set about the business of converting both UIs into paper. We already had an outline design of our new UI on paper, in the form of PowerPoint, so the initial plan was to re-purpose that so that the various widgets and dialogue boxes could be rendered separately, then printed out on paper and cut out. However, this wasn't as trivial as it sounds – considerable time had to be spent on deciding exactly *what* components would be needed, and in what form (e.g. some dialogue boxes are unchanging, whereas others have content that changes according to context. These need to be 'templated' wherever possible, to minimise the number of separate interface components needed for the test itself). Examples of some of the Tallis UI components can be seen in Figure 1.

In addition, Tallis was a large and complex application, with many different aspects to its functionality, so it clearly was neither necessary nor desirable to implement the whole of its breadth and depth on paper. Instead, we needed a subset that mapped onto the tasks we intended to give our test participants – hence the need to consider the test script itself.

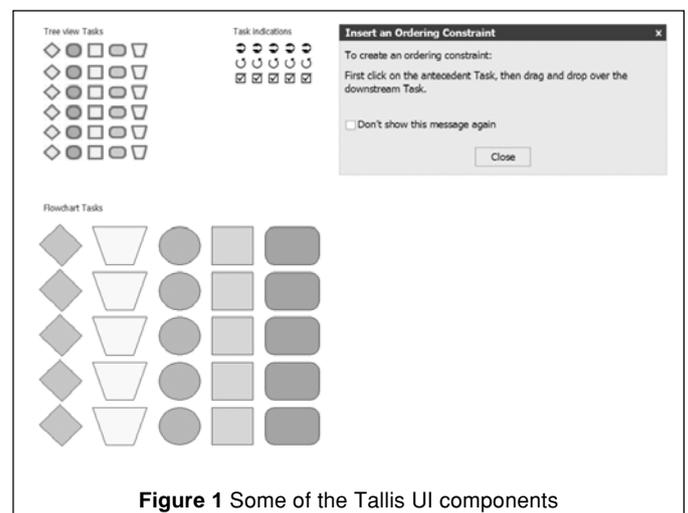


Figure 1 Some of the Tallis UI components

Participants and test scripts

But before we could think about the test script, we needed some users. We quickly ruled out the possibility of recruiting busy clinicians (our ideal audience), partly because we knew their time was limited, and partly because we needed to prioritise their involvement wherever possible in favour of the more formal scientific work going on in the lab. Instead, we needed an audience who would be interested in what we were doing; yet understanding that this was in some senses a pilot of the methodology itself. We found just such an audience in UCL's HCI students (to whom we are very grateful for their time and enthusiasm in taking part in this study).

Of course, there's a big difference between HCI students and the clinical professionals for whom this software is primarily intended. But Tallis isn't aimed exclusively at clinicians; (in fact, many users come from a more AI-oriented, 'knowledge engineering' background), and from a usability point of view, we felt that many of the key problems with the existing Tallis UI would be experienced by *anyone*, regardless of background. It did, of course, mean that the participants would need to receive a brief lesson in the basics of knowledge modelling, so that when they undertook the test, they would at least understand the high-level principles of what they were had been asked to do, if not the precise UI practicalities.

So, now that we had nailed down our users (metaphorically speaking – although we did at times wonder what to do if one of them chose to leave early) we needed to decide just how much breadth and depth to put in our prototypes. And for that, we needed to return to the issue of tasks.

Choosing which tasks to put in a usability test is always something of a compromise (between time, resources, budget, the issues you wish to explore, and so on), which is well covered in the usability literature (e.g. Rubin [3]), so we won't spend additional time on it here. Suffice it to say that we identified half a dozen tasks, ranging in complexity, which we thought would exercise the majority of the key problems with the existing UI in a fixed 90-minute period. We also chose those tasks on the basis of their suitability for some sort of quantitative analysis (e.g. error rates, completion times, etc.), so that we could eventually derive a set of numerical metrics with which to compare the two UIs. We then documented these as a task script, using suitably neutral terminology (so as not to present a bias in favour of any one interface). We also set a maximum time in which to complete each task, after which we would simply move on to the next one.

Finally, we also had to prepare a paper prototype of the existing UI, by creating a further PowerPoint mockup (so that the look and feel would be consistent with the first), then repeating our game of print – paper – scissors. In all, it took us probably three weeks to prepare the paper prototypes, which in hindsight was possibly a little indulgent. However, in this period we did mock-up **two** separate UIs, and we did experiment with a lot of variations on the prototyping process. And it was a highly complex UI (as visual authoring UIs tend to be, with many components that can be arranged and manipulated on a 2D canvas).

The test itself

Our test involved eight participants (we did originally hope to recruit more), which we stratified into two groups (one for each UI) and also by gender/background. The test itself was heavily scripted, so as to minimise any variation in our behaviour that might otherwise bias the comparison. The experimental setup is shown in Figure 2, in which a participant can be seen interacting with the paper prototype. Just out of shot are the moderator (the individual running the session) and the Computer (who operated the prototype).

As is typical with paper prototyping, there is no keyboard or mouse – to enter text you just use the pencil, and for mouse movements you just use your finger (and say whether you are right clicking, hovering, etc.). The drop-down menus can be seen at the top of the picture, attached to the main application window with sticky tape and are revealed or concealed as and when appropriate.

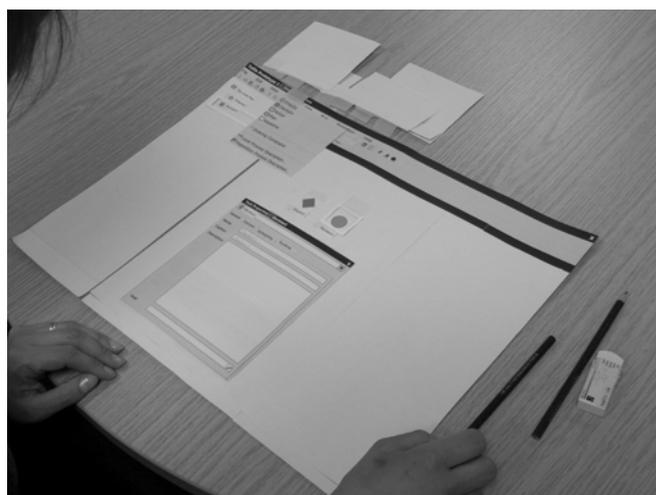


Figure 2 Interacting with the paper prototype

The results

Our test was primarily designed to elicit quantitative measures with which we could compare the usability of the two UIs. However, we won't be going into any detail with the results here, as (with only eight participants) they're not significant, and besides, they are not really the focus of this article anyway. Moreover, as is often the case with usability testing, the most valuable results can be the qualitative (verbal) feedback received during the test itself. Nonetheless, Figure 3 shows an example of the quantitative results: the number of participants to fully complete each task for each UI. As can be seen, the redesigned UI (UI2) performs better in almost every case.

Similarly, the redesigned UI fared better on just about every other metric: levels of completion (of each task), average task score, time to complete tasks, etc. But in a way, the detailed results aren't really that interesting for an article on paper prototyping – what matters is the methodology we used: to what extent that was a success, what we learned from it, and whether we'd use it again.

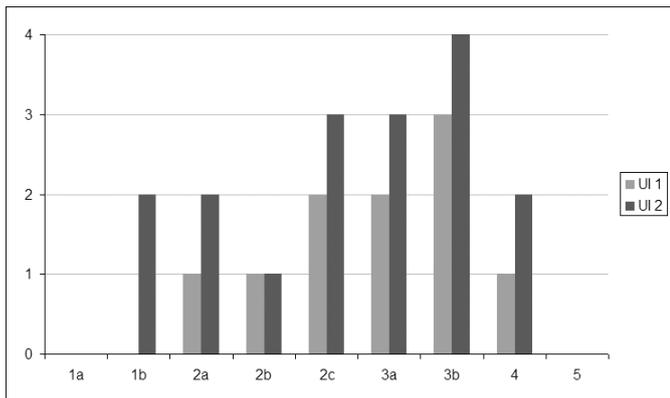


Figure 3 Number of participants to fully complete each task

Conclusions

So, was paper prototyping a success? Almost certainly. It allowed us to explore the differences between two complex UIs and find answers to some difficult questions within a relatively short space of time. In fact, one of the good things about paper prototyping is that it allows you a certain amount of opportunism – for example, we could see by half way through the test that participants were struggling to find a certain menu item – so we modified the menu structure, and thus solved the problem for later participants. Obviously, there is a judgement to be made as to precisely when to make such

changes (they can inevitably affect the validity of the experiment in a scientific sense), but on this occasion it seemed more important to take the opportunity to test a potential solution to a known problem.

And as for our experience with the methodology – yes, we'd definitely use it again. Like a lot of practical skills, you can learn a great deal by reading books and articles on the subject, but there is no substitute for trying it for yourself. Good luck!

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UPA Journal of Usability Studies

Starts late 2005

The Usability Professionals' Association (UPA) has announced the launch of a new publication in late 2005, the *Journal of Usability Studies*. This publication will be a peer-reviewed, online journal dedicated to promoting and enhancing the practice, research, and education of usability engineering.

The *Journal of Usability Studies* will publish articles on:

- Quantitative and qualitative user studies that have some generalisation value for any interactive product
- Empirical findings of usability tests (but not the full usability reports)
- Comparative studies between usability methods, approaches, and techniques for planning and conducting usability tests
- Newly defined and tested usability metrics or data analysis approaches
- Academic research that has strong practical and applicable implications for design and testing
- Critical or thought/discussion papers challenging and questioning practices and proposing innovative ideas and approaches
- Empirical development and implementation of usability standards and guidelines.
- Comments, replies, and responses to published articles.

"Looking for the most recent findings of usability studies? Looking where to publish interesting results from your own usability studies?"

Ann Light

The lack of answer to these questions has long been due to a gap between academic research and business case studies. JUS will fill this gap by providing usability practitioners and researchers with a forum to share usability research case studies, empirical findings, opinions and experiences in the practice and teaching of usability engineering, emerging methods and good practices in usability engineering," say the organisers.

The journal will appear online quarterly starting the last quarter of 2005. It will be linked to the ACM's digital library. Each submitted manuscript will undergo a blind peer-review process managed by the members of the editorial board. To ensure a rapid turn-around and currency of published papers, each accepted paper will undergo only one revision round when necessary.

For more information and call for papers, visit the JUS web page (www.upassoc.org/upa_publications/journal/), or write to the editor, Avi Parush, at jus@upassoc.org.

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Experiencing design

Getting better all the time

Robert St Amant

In American advertising, no phrase is more cliched than 'new and improved'. Simplicity and ease of use in an existing product are often no defence against incremental 'improvements'. In many cases, results are predictable: a perfectly reasonable interactive experience suffers some unfortunate change.

Usability testing for entirely new systems can in some ways be less problematic than for systems that have been upgraded. In the latter case, there's a strong temptation to take shortcuts. Designers may have preconceptions about the importance of what has and has not changed, and these expectations may lead to potential problems being ignored. One of my students gives an example:

One day my young cousin asked if she could play with my new handheld video game. A few moments later she came back to me and said that it didn't work. When she gave it back to me, I saw that she'd put in the game cartridge backward. With my older game system, this would have been impossible because of a little sliding mechanism that makes sure the cartridge goes in the right direction, but my new game doesn't have the same design. It took me several minutes to get the backward cartridge out.

It is possible that the designers believed that users would be experienced enough with previous products to use the new product correctly, or that visual guides instead of physical constraints would be enough for correct usage, or that this problem only arises in some unlikely circumstances. For individual users who run into difficulties, of course, this is little consolation.

Usability evaluation of upgrades to a system can identify obvious problems. Sometimes, however, the problems that arise can be subtle:

In the store where I work, we sell a combination night light/room deodoriser, which plugs into an electrical socket and releases a scent. It has a little flower on top. The problem with our product is that it covers up both sockets in a standard wall outlet. If you plug it into the top socket, the light bulb covers the bottom one, and if you plug it into the bottom socket, the flower part covers the top one. People are going to have to unplug the night light every time they need to plug something else in, unless they have a lot of outlets in the room.

In this case, usability problems with the improved night light might not appear if it is evaluated in isolation (if an evaluation is even considered for such a simple device) but rather only in the larger context of how the light is integrated into a real environment. The functionality added to the light is offset by the loss of existing functionality that is not, strictly speaking, part of the light itself. Varying context can make potential problems harder to identify.

Other problems can be seen when new functionality is given to users who don't understand it or don't need it:

There's a new feature that Volkswagen has put in their Jettas. If you turn your key all the way to the right when unlocking the door, all four of the windows roll down at the same time. For the life of me I do not understand why a car needs to have all the windows roll down when you want to get in. When I first got the car two years ago I was constantly frustrated, but eventually I

learned the art of unlocking my car. When my boyfriend or one of my family members wants to borrow my car, I always have to remind them that my car has this crazy feature.

It might seem obvious to an automobile designer that in a hot climate, opening all the windows easily and quickly would be a desirable function. For one user, however, it's not even conceivable how this could be useful.

Yet another case shows how a lack of distinguishing features between an old product and its replacement can lead to problems:

When I bought a new car last year, I put a "North Carolina State University" sticker in the rear window. The new sticker looked just like the one in my old car, with red letters on a clear plastic background. I put it on and smoothed out the air bubbles. Unfortunately, it was not exactly like the older stickers. After a few months the background plastic started to peel off, and I realised you're supposed to press the sticker on and then peel it off immediately, leaving only the letters. By that time the background had become brittle and came off in pieces, along with some of the lettering. I had to scrape it all off with a razor blade and start over.

When I describe these examples to the students in my HCI class, a common initial response is to wonder how users can fall into such obvious errors. As the students gain more familiarity with HCI concepts, it is easier for them to recognise categories of such problems in changing an existing system and to apply standard lessons for avoiding them:

- Preserve the usability merits of the existing system, if used standalone or in combination with other systems.
- Accommodate usage patterns for the existing system, so that previously learned behaviour does not lead to errors.
- Make it easy to learn new functions that are added to the existing system; ensure that new, easily learned or applied functions are actually desirable.

The first and probably most important lesson my HCI students learn in improving a system, though, might be cast as a designer's version of the Hippocratic Oath: First, do no harm to usability.

Robert St Amant

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Robert St Amant is an associate professor in the computer science department at North Carolina State University, currently on sabbatical from January 2005 through December 2005 at the Information Sciences Institute, University of Southern California. The work in his lab is a blend of human-computer interaction and artificial intelligence, with an emphasis on planning concepts. He's interested in building intelligent tools to help users with complex tasks.



Book reviews

Two reviews for you this issue.

Firstly Lorna Heaton from the University of Montreal gives a transatlantic perspective on *Spaces, Spatiality and Technology*, a collection of papers from a seminar at Napier last December. The volume is edited by Phil Turner and Elisabeth Davenport.

John Knight, a regular reviewer, follows with reflections on *Technology as Experience* by John McCarthy and Peter Wright; a thought provoking book by all accounts.

This is my last set of reviews – I have been editor now for two years and a most enjoyable experience it has been, the hardest part being passing on the interesting books that pass your way on to others to review. However it is now time to move on and I am pleased to report that John Knight has agreed to take over.

John would welcome suggestions for titles to review and offers to do reviews on texts related the general themes of HCI, Interaction Design, User-Centred Design, Usability and associated themes. You can contact him at John.knight@uce.ac.uk.

Thanks to everybody who has helped me over the past two years through contributing reviews and best wishes to John. I look forward to stepping back to the role of reader for the next set of reviews.

Sandra Cairncross

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Spaces, Spatiality and Technology
Phil Turner and Elisabeth Davenport
(Eds)
Springer 2005
1-4020-3272-2, £62.00

This book is a collection of eighteen papers presented at a Research Seminar in Edinburgh in December 2004. It includes both conceptual and empirical papers from a variety of perspectives. Human-computer interaction is well represented, but there are also a number of contributions from architecture, urbanism and even philosophy. Empirical examples include a teaching laboratory, a public library, the intellectual spaces of scientific communications, public places, the theatrical stage and mobile working, as well as virtual spaces populated by avatars.

The diversity of contributions and perspectives is, I believe, a major force of this volume. The juxtaposition is stimulating and thought provoking and it invites the reader to make connections across disciplines and domains of study. The eclectic nature of the contributions is also a weakness, however. A critical reading might point to the difficulty of finding a common thread among the chapters, beyond the general concern with the same subject. The collection would have benefited from a more ample introduction to facilitate the readers' synthesis and sense-making work.

Editors Turner and Davenport appear to have deliberately left the contributions to speak for themselves. They limit their intervention to a brief

introduction, in which they suggest the reworking of notions of infrastructure as an important theme, but they do not elaborate on what this might mean. Similarly, while they point to the emergence of a new vocabulary to describe relationships among multiple modalities, it is unclear, after reading all the contributions, whether we are actually witnessing the emergence of new vocabularies, which suggest common understandings, or a multiplication and diversification of lexicons. As in Chekhov, speaking through Trepnev, the would-be poet/playwright in *The Seagull*, to plead for 'new forms', clearly there is a great deal of experimentation and searching to find a form that can adequately represent experience in this emerging field.

The tone of the volume is set with a chapter by Richard Coyne which draws on a wide set of sources to discuss the tendency of digital media to produce otherworldly, strange or disorienting effects. In discussing this 'Digital Uncanny', Coyne reflects on the mismatch between expectation and reality often introduced by digital media as different interpretations of reality compete with one another for primacy. Subsequent chapters are organised according to four major themes: the social shaping of space, infrastructure, hybrid space and virtual space and place. The editors undoubtedly had considerable difficulty in sorting the papers, since many of them are difficult to situate squarely in one theme or the other. This overlap

has its advantages, however, since a number of themes are recurrent.

A number of contributions (eight of 18) are concerned with how relationships are shaped and constructed in situations which generate flows between elements. They investigate how space may be constituted by social practices and how, in turn, spaces influence and regulate social activities. The spaces are both physical (laboratory, library, public or community spaces) and intangible (social processes of science). In the second section, infrastructure is discussed in terms of networks of relationships between an extended group of actors. For instance, Day (chapter 11) explores the concept of « surface » to give space a materialist and historical meaning and to define infrastructure as the product, rather than the context, of expressive events. The other chapter in this section (Dix et al.) links models of spatial context and mixed reality boundaries with actual experiments on digitally enhanced environments to reflect on how people experience multiple, interacting spaces. This is in marked contrast to the typical separation of interface and infrastructure design in different spheres, with infrastructure usually treated as the backdrop for design activities.

The final two sections of the book discuss hybrid or technologically mediated spaces. Among them, Jacucci and Wagner (chapter 14) reflect on how configuring and reconfiguring a space affects performative action within that space. They also explore connections between spaces and the



Edited by Sandra Cairncross

integration of mixed representations within a space. Ciolfi & Bannon (chapter 15) also explore the interaction of technologically enabled or created spaces with physical environments. They question common assumptions in technical research on interactive spaces which tend to view context as something external and open to capture (this is not unlike placing interface and infrastructure design in separate spheres), and call for consideration of social interaction and affective responses. Here, again, there is an interesting effort to bridge between conceptualisation and actual systems design. The book concludes with two papers that discuss virtual environments. Drawing on Benford et al.'s work on spatial metaphors, Zhang and Furnas (chapter 18) discuss scalable interaction and awareness. Finally, Turner, Turner and Carroll (chapter 19) elaborate on Urry's (2002) notion of the tourist gaze as a way of exploring contextualised presence.

The fact that a number of themes recur across several contributions suggest that we may be observing the

development of a new interdisciplinary field of 'spatiality studies'. Numerous contributions reflect on notions of space and place, including understandings, meanings and memories, in both physical and technologically mediated contexts. Performativity, bodily experience and materiality also figure prominently, as do discussions of context, networks and shifting levels of interaction and analysis.

While it is difficult to imagine a more up-to-date work – going from presentation of original work at the seminar to hard copy in only a few months – its speedy publication was achieved at the expense of careful copy editing. In terms of form, there are a number of minor details, primarily standardisation of format within and between chapters that could have been improved. For instance, some chapters are followed by the author's institutional and disciplinary affiliation, which enables readers to better situate the contribution, while others do not include this information. These details are illustrative of the tradeoffs between

speed and thoroughness, and between a finished, polished whole and an assemblage or collection of pieces, that characterise this volume.

The major value of *Spaces, Spatiality and Technology* lies in its juxtaposition of the empirical and the theoretical, and in its presentation of a variety of perspectives around common concerns. It represents a valuable collection of cutting-edge work and thinking that gives a partial, but interesting portrait of the diversity of work being done in an emerging field. What may be lacking in unity is made up for in timeliness and interest, and in sparks of originality. The editors chose to get the work out quickly and to encourage exchange. In doing so, they invite readers to make their own associations and connections and to combine these ideas in yet other ways. What better way to open new avenues for exploring space, spatiality and technology?

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Technology as Experience
John McCarthy and Peter Wright
MIT Press 2004
262134470, £22.95

This short book is packed with ideas. It makes a compelling case for 'a new approach to human-computer interaction through examining the felt experience of technology.' At the heart of the book are the ideas of John Dewey and Mikhail Bakhtin. The authors develop these ideas and argue that technology is deeply embedded in peoples' lives. Indeed, they suggest that technology can (even) mediate us in new and different ways. Wright and McCarthy argue that understanding the experience with technology has heretofore been inadequate. What is missing is what the authors call 'felt' experience, 'felt life' or 'feltness'.

Our first proposition is that, in order to do justice to the wide range of influences that technology

has in our lives, we should try to interpret the relationship between people and technology in terms of the felt life and the felt or emotional quality of action and interaction. (012)

Technology as Experience could be seen as part of the trend for all things emotional. The book is, however, quite a different proposition from the norm. It is deeper and more sophisticated than many attempts to broaden HCI. How is it deeper? Well, the authors contextualise 'the felt life' in a number of ways. The philosophical background is thought provoking and links the present to the past. The identification of motivation and value as key components of experience link emotion to action. Uncovering the bias of methods, towards rational accounts of activity, gives a practical edge to the work.

The authors describe experience in terms of its sensual, emotional,

compositional and spatio-temporal threads. This description is drawn partly from the perspective of pragmatist philosophy that emphasises holism and 'unfinalizability'. Experience defies division and dualism; we experience as a continuous totality. In different ways, both Dewey and Bakhtin put aesthetics (and ethics) at the centre of their conceptions of experience. Here, forget any notions of elitism and the highbrow. Aesthetics is defined more broadly as the core of all experience including the 'prosaic' (e.g. everyday). It is not the thing, but the experience that is aesthetic. In addition, this suggests that experience is ethical as it is an exchange of values between people. Lastly, the authors propose that experience is 'dialogical', meaning that it is created as much in design as it is in use.

The authors' adoption of pragmatist philosophy is not just cleverness; it has practical application through informing design practice. They demonstrate



this by using it as a lens to examine how research methods have biased accounts of experience. The authors' ire centres on the lack of 'feltness' in rationalist accounts of experience:

In this regard, we part company with practice-based approaches and theories when they play down the emotional and sensual quality of experience ... It may be that in order to interpret felt experience we have to inquire from the subject what the activity felt like as felt experience entails reflection, after the event, on the personal meaning of the experience. (014–015)

The authors are not content with criticising the past. The evaluation of methods informs the penultimate three chapters of the book. These apply the lessons of pragmatist philosophy to research methods. The methods are not meant to be templates. Instead, they offer insights into how experience can be understood, communicated and interpreted.

The last three chapters of the book indicate how different methods and domains tell different things about experience. The first chapter is a personal account of an online shopping experience. The second describes a pilot's experience with procedures which is almost ethnomethodological in nature, and the final chapter is an

ethnographic style account of an ambulance control room.

The book concludes by looking at future trends and the implications of 'technology as experience' for design. The authors search for alternatives to the 'reification' of professional design practice in literary and artistic approaches to design. *Technology as Experience* is quite challenging but can change the way you think about HCI, yourself and possibly the world around you.

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