

# Interfaces

No. 44 Autumn 2000

British  
HCI  
Group  
[www.bcs-hci.org.uk](http://www.bcs-hci.org.uk)



*accentuating the positive  
evaluating virtual environments*



*moving multimedia  
playing for research*



*...and only 365 usable days until IHM-HCI2001...*



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## Notes from the Chair

I am sure that many of you will want to join me in congratulating Alan Newell who was awarded an MBE 'for services to IT and communication for people with disabilities' in the Birthday Honours list announced in July.

Alan has been a major international force in putting assistive technology on the HCI agenda. The message he has been effectively peddling for several years now is that designing for these 'extraordinary' users also benefits the larger 'normal' population. They present hard design problems that force designers to rethink what they are doing and what can be achieved.

Alan's contributions are prolific, over 200 papers and 12 patents. He has also made a considerable contribution to the teaching of HCI with the innovative Computer Science degree course structure adopted at the Applied Computing Department in Dundee.

Well done Alan. Readers with a multimedia bent may also be interested to know that Wendy Hall (University of Southampton) was awarded a CBE 'for services to education and science' in the same list.

You will by now have received the Annual Report detailing what your executive committee have been up to in the last year. The AGM is to be held at HCI 2000 in Sunderland (5.30 p.m., Thursday 7 September). Please come along if you have any comments or suggestions. The formal part of the AGM rarely goes on for more than 15 minutes so that we can adjourn swiftly to a suitable hostelry.

I look forward to seeing as many of you as can make it to the conference. I have been involved in a minor way in the conference committee and I can assure you the programme is excellent and the venue a treat.

Andrew Monk  
British HCI Group Chair

### 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.

Deadline for issue 45 is **15 October 2000**. Deadline for issue 46 is **15 January 2001**. Electronic versions are preferred: RTF, plain text or MS Word (5/6), via electronic mail or FTP (mail fiona@hiraeth.com for FTP address) or on Mac, PC disks; but copy will be accepted on paper or fax.

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

### 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**— we look forward to hearing from you.

With thanks to commissioning editors Kristine Faulkner and Alistair Kilgour.

To receive your own copy of *Interfaces*, join the British HCI Group by filling in the form on page 19 and sending it to the address given.

## Editorial

Welcome to issue 44 of *Interfaces* – the magazine that links you with information about how people might link up with information ... and more!

This is my first issue as editor, and I pay tribute to the permanence of the contribution of my predecessor, Janet Finlay. Not only did she build a formidable magazine, but she tirelessly pressured people to write for these pages. The contributions continued to roll in for this issue, but for the next I suspect I need to develop my own coercive skills.

This is where you come in. You can spontaneously bounce four or five hundred words to me at [t.mcewan@napier.ac.uk](mailto:t.mcewan@napier.ac.uk) at any time of day or night, and see your work in print. Interactivity, usability, whatever we want to call it, is moving from scholarship to commodity. Your ideas are becoming sexy, increasingly the unique selling point of solutions. Once the public finds something useful and affordable, it will not accept less.

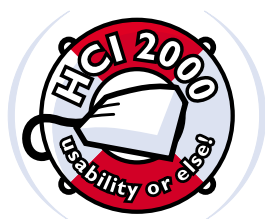
I want this magazine to continue to be a cauldron of ideas and opinions. Ironically, sometimes we get buried in our own terminology in this community. You have the ideas. Are they understandable to, usable by, those who make the products, or systems, that we all use? Save purer scholarship for the journals. I want to know what you *feel* about any kind of interface. It is intuition and empathy that binds us to the needs of the end user, so opinions are good. No matter how extreme we may think each other's views, it is as nothing compared to the complexities of cultures and capabilities out there.

Over the next year, starting with commercial imperatives at HCI 2000 in Sunderland, we meet some of this complexity. With IHM-HCI2001 in Lille (as Alistair Kilgour describes herein), we are already dealing with the challenges of communicating across cultures!

Words are the interface to your ideas. Keep the interface as simple as possible.

Tom McEwan  
Editor

## Register now for HCI 2000!



Unless it's after September 8th or you can't get to Sunderland by then. If so, then it really is your loss (don't miss Lille in 2001).

Otherwise, visit

[www.bcs-hci.org.uk](http://www.bcs-hci.org.uk) now and register.

You really should be there. As I write this piece, the registrations are still rolling in. The hotels are full (but feel free to find your own if you don't fancy a very new student hall of residence). The programme is even more full, as you can also see from the web site.

Of course you'll learn from the technical programme. Of course you'll gain substantially from the tutorials. But most of all, you'll gain from up to three and half days of interaction with fellow professionals and researchers.

You can see for yourself what's new and exciting from the programme on the web. The names and titles say it all. What the web can only just hint at, however, is that HCI 2000 is at the seaside. The beach is 10 minutes away, and so are the bars and restaurants between the campus and Lowrey's favourite holiday hotel. The sun has been fairly constant since July, so let's hope that the good weather holds out until the conference.

You can't see who's registered yet from the web, but rest assured that there'll be old faces

who you need to catch up with, and new ones, many of them research students who are defining the next agenda for HCI, and others new practitioners who are evidence of the expansion of HCI expertise into e-business and digital media.

As with all general chairs of HCI conferences, I have two views on my experiences to date: (a) I love it; (b) I hate it. You can guess why for each. It's great to work with competent, committed, enthusiastic and inspired committee members from across the HCI community. It's great to see a conference taking shape, with a growing sense of achievement. As for the hate, that will hopefully have worn off by Christmas. By then, the constant stream of loose ends, oversights, missed deadlines, uncertainties and unexpected complications and complexities will be well behind me.

So please, if you can come, do come. It would be such a shame if you missed *my* conference. You'd also be missing Sharon's conference, Susan and Phil's conference, Yvonne's conference, Mary and Peter's conference, Fintan and Darryn's conference, and of course Lynn's conference, as well as all the bits from Fintan, Darryn, John, Chris, Bob, Richard, Russel, Peter and Alan. If I've missed anyone, then sorry. There's a great team working on HCI 2000, so the least you can do is to turn up and thank them.

Gilbert Cockton  
HCI 2000 Chair



# Usability evaluation for virtual environments: Methods, results and future directions

This two-part report summarises an international workshop held at De Montfort University, which explored the usability evaluation of virtual environments (VEs). The workshop used chaired discussions between the 42 participants to examine current approaches to evaluation of VEs, the difficulties in utilising evaluation techniques designed for conventional desktop interfaces, and to identify gaps in the problem space for future research. In the last issue we reported discussion on aspects of VE usability; here we consider the role of different evaluation methods in assessing VEs.

## Part 2: Usability evaluation methods and VEs

### **Controlled experiments**

*Chair:* Anthony Steed

*Contribution:* Controlled experiments can be used for evaluating the effect of specific features on usability.

*Main question:* How should controlled experiments be carried out as part of VE usability evaluation?

Generally, it was felt that, given the relative infancy of experimental work in VEs, it was not yet possible to describe a set of best practices or to outline the basic principles of experiments in this area.

There was felt to be too much pressure to do controlled experiments and there was too much expectation placed on individual experiments to provide re-usable results. Obviously with the relatively small number of experiments and the fluid nature of VE systems and applications, generalisable results are few and far between. However, this would be helped by our community (and funding bodies) supporting a culture of experiment replication and validation. One point that was made was that it is very hard to replicate an experiment exactly given the difficulty in describing on paper the display system, interaction metaphors, 3D models, etc. Indeed, this is often limited to a snapshot, polygon count and machine specification. Making experimental material available would enable replication to be done more quickly and easily.

Some specific things that the group felt ought to be encouraged included the fostering of multi-disciplinary experimental teams and the integration of more methods from other fields. With a move towards validating VEs that are used outside the lab, this might be quite urgent. One participant reported that, for example, current experimental practice in VEs would not meet the stringent requirements of the medical community, which requires experiments to be run double blind, and this was directly affecting the ability to deploy VR-based surgical trainers.

Overall the participants felt that we had moved beyond the preliminary stages of experiments in certain key

areas such as navigation and interaction in VEs. One immediate hurdle to tackle was that of coping with subject variability, particularly subjects who had a lot of experience playing 3D computer games. There was also a need to do more longitudinal studies with larger sample sizes, though with the technology moving so fast, stability of the platform would be a limiting factor in this regard.

### **User observation**

*Chair:* Howell Istance

*Contribution:* User observation is the primary method for usability evaluation of an application.

*Main question:* How should observation of users be carried out as part of the usability evaluation of VEs?

The discussion started by listing some of the types of tasks that were candidates for observation in VEs, together with some of the metrics that could be extracted from studies. The former included skill building and procedural training tasks, problem solving, navigation knowledge acquisition and collaborative tasks. Collaborative tasks may be open-ended where completion or an end point is not easily defined. The metrics listed at the outset included time spent looking at the screen, eye-movement patterns, physiological measures, metrics associated with communication analysis, think-aloud protocols, and times for task completion. Additional approaches included observation of the avatar and simultaneous real-world activity in collaborative VEs, and comparative studies of collaborative activities between video conferencing, real world and VEs.

Group members' experiences in conducting observational studies in different contexts were then examined. One member described studies using VEs to facilitate learning in children with learning difficulties, where a tutor and the child worked with a desktop system. Video of the two participants was the primary means of collecting data. The issue of the time required for analysis was raised, which is familiar in the use of video with conventional interfaces. Also the



## Workshop at De Montfort University, Leicester, UK

**Kulwinder Kaur Deol, Anthony Steed, Chris Hand, Howell Istance and Jolanda Tromp**

problem of linking the video of the external scene with the location within the VE was raised. This can be addressed by recording the screen image onto a separate video and using the audio track from both videos to synchronise the data from the two videos.

Another member described a study of how disabled children build spatial maps of buildings presented in a VE. Here a route of the child's exploration of the building was maintained by triggering an automatic logger when way-points were passed in the virtual building. A further member described a study that compared training techniques that did and did not use a VE. Here, it was performance in real-world tasks following training which was assessed using observation and task performance metrics.

Investigating members' prior experiences was found to be very informative. A discussion followed and, from this, techniques involving observation were grouped into qualitative and quantitative. Qualitative techniques tended to be used in collaborative environments, and/or to study collaborative behaviour. These facilitated study of individual patterns of use, rather than characterising group behaviour. Tasks tended to be loosely or completely unstructured. Enabling behaviour patterns to be identified typically required large amounts of data to be collected and analysed. Quantitative techniques, on the other hand, focused on characterising performance through the collection of task-specific data. These were used primarily for evaluating single-user systems. Tasks tended to be well defined and structured, with an identifiable end-point. Studies using these techniques enabled generalisations to be made about the effect of treatments or conditions within groups of participants. However, as with any approach that attempts to characterise performance by means of simple metrics, it was possible to lose sight of underlying causal factors that are illuminated through qualitative approaches.

### **Interface inspection**

*Chair:* Jolanda Tromp

*Contribution:* Interface inspection is an efficient method for general usability data in the absence of users.

*Main question:* How should interface inspection be carried out as part of the usability evaluation of VEs?

The group recognised that previous research (e.g. Steed et. al, 1997) had found conventional inspection methods helpful for evaluating VEs, but significant difficulties existed, which were elaborated, the most significant being that we do not yet have the heuristics for the ideal design of VEs to guide usability evaluation. Additionally, due to the typical technology-oriented demo-stage of VE development, we do not always have a requirement analysis available upon which we can base the inspection. Therefore, we do not always know exactly what we need or expect from the application, including who the representative end-users will be. Furthermore, supporting multiple users, who are expected to manage multiple tasks through multiple communication channels, complicates the definition of typical tasks to be performed in a traditional hierarchical task-tree for inspection. Additional differences need to be taken into account in VE evaluation, as well as users and tasks, such as the systems and their different limitations including real-time rendering and latency, and the unpredictability of user intentions in typically exploratory VEs.

Even when the phase of requirements specification has been skipped in the (early) design of a VE, one has to create a (shortened) version of it in order to inspect the VE. The task needs to be defined by observing user actions and interviewing users, the technology and system also need to be defined, as does the design of the application by designers and usability experts. Affordances of the interface can be defined through discussions between users, designers and usability experts. By involving users in the design of affordances, we have a better chance of getting the design right in the absence of clear heuristics.

Based on the requirements analysis one can describe a typical task-scenario, written down as a hierarchical task-tree. For each step in the tree, the inspection involves usability questions which can lead to advice on how to improve the design (e.g. Is the action obvious; Is the feedback obvious; Is the next action obvious?). For exploratory VEs, we can record all possible actions in the application, identify the kind of task they belong to and create task-trees for each one. It has proved to be possible to differentiate six general VE task-trees or cycles, and most VE actions can be said to belong to one of them. Each task-cycle, e.g. Exploratory Browsing; Goal directed Browsing; System Initiative; 3D Interaction (all based on Kaur, 1998); 2D Interaction; and Collaboration (based on Steed et al., 1997), has its associated usability questions. These questions are more VE specific than conventional 2D inspection questions, and have proved to lead to advice on how to improve VE design.

In short, an adapted inspection method allows us to inspect 3D, multi-user VEs, by checking the ability of the application against required VE affordances. Performing inspections on current VEs can help us to define an 'Expert Checklist' of specific usability issues, and ultimately design heuristics, and guidelines. By going beyond the traditional hierarchical task-tree to adapt methods to exploratory VEs, we can address many of the novel issues introduced by VE interfaces.

### **Design guidance**

*Chair:* Kulwinder Kaur Deol

*Contribution:* Design guidance is important in tackling or avoiding problems found in usability evaluation.

*Main question:* What design guidance is needed to support the evaluation and development of usable VEs?

The discussion started with the assertion that the design process needed to be understood before proposing guidance. Preliminary work on understanding VE design, such as Kaur et al. (1996) indicates that it is often characterised by ill-defined



requirements, and an informal, iterative and short development cycle. The level of craft or engineering practice was important to understand and it was felt that craft practice was predominant for short and demonstration-level projects, whereas engineering practice may be more common for large VE development projects involving systems for prolonged use, such as those found in military organisations. The level of user participation was also felt to be important to understand and it was felt that generally little user involvement was practised.

From understanding the design process, required characteristics of VE design guidance were proposed. In particular, guidance would need to be quick and flexible to apply, and informal to complement design practice. Formative evaluation guidance would be needed so that designers could check the usability of design ideas and prototypes early. The reasons for the importance of applying the guidance should be included to provide motivation to designers. Several example techniques of applying guidance would be needed to enable re-use of tried and tested ideas. Current successful games and VEs in use could be investigated to accumulate these techniques. The question of standards for VEs arose and was not resolved. On the one hand, standards would reduce learning and allow users to immediately recognise features, but the downside would be design restrictions and perhaps less novel or interesting VEs for exploration. However, standards may be forced upon the industry through consumers being 'locked-into' particular platforms, devices, interaction paradigms, etc. It was also proposed that specific development cycles could be followed for VE design that would incorporate iterative design within an overall structure. More user-centred design should be encouraged and ultimately guidance should facilitate design by users themselves. Usefulness and relevance of a VE application to an organisation was an important issue not to be overlooked.

A more detailed discussion of design guidance for usability then followed. Such guidance could take the form of suggesting user support features embedded into object

representations (e.g. natural cues), or suggesting the use of language, symbolic signs (e.g. no-entry signs), highlighting (e.g. making active objects salient), animations (e.g. to demonstrate actions), or using agents to help and guide the user (e.g. showing the user around). It was noted that there would need to be some internal coherence in a VE on the techniques used for user support. Several constraints on techniques were identified, including the importance of maintaining the naturalness of the VE, balancing level of detail and run-time performance, considering display clutter, the importance of task completion and efficiency over retaining some level of fun and challenge, considering cultural differences (e.g. for gesture definition) and generally considering the variations possible on the user characteristics, devices used, etc. The importance of naturalness would depend on the application, but perhaps different techniques could be developed to provide the same usability benefits whilst offering different levels of fidelity. It was felt that fast task completion times were generally less important in VEs than in other systems, such as data processing, word-processing, etc. It was unclear how to judge the level of realism/fidelity required and how to design for different levels. The design of agents/avatars was noted to be a complex, unresolved issue, as was deciding which modality to present information in. Hybrid systems, which incorporate features of other interface types (e.g. buttons and menus) as well as a virtual world, would require special consideration both on the techniques to use for different interface features and the coherency and links between them.

Current work towards VE design guidance included work on navigation such as the PERSONA (personal and social navigation) project, single-user VEs such as the guidelines in Kaur (1998), multi-user VEs such as the COVEN (collaborative VEs) project and preliminary work on perception of VEs and individual differences. Guidance on designing for fun and enjoyment, and more contextual organisation-level guidance was felt to be required. Some success in applying guidance through improved usability had been reported in Kaur (1998). In summary, although some useful work

had been carried out in this area, there was a lack of research on VE design practice and required guidance. A list of relevant areas of literature was proposed, including architecture and space syntax, architectural patterns, semiotics, socio-linguistics and media theory. Some traditional HCI guidelines were also relevant but needed adapting; for example, many did not consider the issue of maintaining naturalness.

## Conclusions

The workshop format allowed for an effective cross-fertilisation of knowledge, experience and opinions. All participants contributed to the discussions and found the workshop enjoyable, rich and stimulating. Nine discussion sessions took place which all provided a productive debate towards answering the main questions. While no definitive solutions were reached, progress was made towards mapping out the problem space and identifying research questions. The usability of VE interfaces was broken down into issues of understanding single-user and then multi-user interactive behaviour and support requirements; gaining a deeper understanding of core aspects in particular navigation and presence; and understanding the wider context of work organisation and utility. It would be important to understand all these aspects of VE usability and how they affect each other. Evaluating VE interfaces was tackled by investigating how conventional techniques (both user-oriented and expert inspection) needed to be adapted for VEs, and the design level advice required to avoid usability problems in the first instance or solve identified problems. The discussion of user reports was not popular and did not take place, probably because participants wanted to discuss more difficult and sophisticated evaluation techniques.

Several common themes emerged from the group discussions, which were outlined in the summary session. A major theme was whether VEs were different enough to conventional interfaces to warrant special research and methods. Some participants felt established techniques should be used, whilst others felt new techniques should be developed. There was some general consensus that there were similarities between VEs and



conventional interfaces, but also important differences. Therefore, some existing usability theories and evaluation methods could be applied but, whilst some criteria would also hold for VEs, other criteria would not be relevant and additional criteria would be needed for novel aspects. Other themes included the issue of individual differences, which could be especially significant in VEs, and how to tackle it. Also, it was felt that currently VE development involved a lot of demonstrations or prototypes and few working applications. Perhaps this situation would change as industry realised the potential of VEs and their use was incorporated into organisations. In the past, technological maturity could be blamed for this, but now it was likely that issues including usability were holding back the acceptance of VEs in industry.

As a final note, the size of the workshop indicates that usability evaluation is a growing interest in the VE field. The industrial participants recognised the importance of usability and evaluation and were keen on developing practical solutions to the problem. We hope this workshop encourages and paves the way for research towards this aim in the coming years.

## Acknowledgements

We would like to thank all participants for their contributions to the workshop, and student volunteers for their help. Thanks also to the workshop sponsors, namely the British HCI Group, De Montfort University and the COVEN Project (ACTS N. AC040).

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*deadline for submission of synopses Friday 6 October 2000*

<http://www.iee.org.uk/Conf/PIC2001/pic2001@iee.org.uk>



# Accentuate – the positive (and other strange characters)

**Alistair Kilgour went native**

A new series in which the Uncle Seabirds of HCI look back, in exhaustion more than anger, at the mess that results from everyone ignoring what they knew decades ago. (*Uncle Seabird* was a song on Clive James' first album in the mid '70s, and might have been about Ralph Gleason of *Rolling Stone* magazine. At the time *Rolling Stone* was covering the emerging geeks of Palo Alto, but that's another story altogether.) Any other old geezers willing to lay bare their confrontations with technology that ignores the fruits of their bygone labours, please email [t.mcewan@napier.ac.uk](mailto:t.mcewan@napier.ac.uk)

## La langue française

Looking towards the first British/French HCI conference in Lille next year, I have been experimenting with how to obtain the accented characters and diphthongs needed in French (such as é, è, ê, ë, ç and œ) within word processing and email programs – given that few of us have access to French-style keyboards. In case this is of interest to others, I will tell you what I have discovered. I would be very pleased to hear from others about their own experiences.

I still use a Mac for most correspondence, though I also use a PC with Windows 98. On the Mac the situation is quite straightforward. More than ten years ago a public benefactor, Günther Blaschik, produced a really neat bit of shareware called PopChar. (Originally it was postcard-ware, now it is shareware with a web site and payment through Kagi.) This pops up a panel with all possible characters in the currently selected font. You click on the one you want and it gets inserted in the currently open document.

However, if you are trying to input French quickly this is a bit tedious. PopChar also tells you what keyboard combinations you need to produce your selected character, and it is not hard to memorise these. The point about the Mac is that these keyboard shortcuts work in all programs – editors, word processors, email programs and browsers, and indeed in the file naming and selection parts of the operating system, so you can of course use accented characters in the names of files and folders.

If you include these characters in email they get transmitted and received correctly by other systems and mail programs, so far as I can tell – except, apparently, the basic mail program on Unix, which is restricted to the basic ASCII character set. And there is a wonderful bonus – you can spell-check in French as well as in English if you use Eudora, and download the French dictionary from the Qualcomm web site. (This is also true, I believe, of Eudora on the PC, though I haven't tried it.)

In the PC/Windows 98 world, things are (unsurprisingly?!) not so simple. In Microsoft Word there is a Symbol entry on the Insert menu, which can be used to insert any character in any font, not just symbols, and through this, as with PopChar on the Mac, you can discover keyboard shortcuts, which not surprisingly are different from those on the Mac, and in fact are somewhat easier to remember. However, to my shock and dismay I found they don't work in other programs, such as Outlook Express, even

though this is another Microsoft product. (Phil Gray informs me they don't work in Eudora on the PC either.)

The irony is that if you paste text with accents into an Outlook Express mail message, the accents get displayed and transmitted correctly. Similarly if you receive a message containing accented text, it is displayed correctly. But so far I have not found a way to create accented characters from within Outlook Express itself. I am sure there must be an answer, and I would be delighted to hear from all you experienced PC users out there that it is really a non-problem.

As an aside, I do have anecdotal evidence that in the world of PC users at large there is widespread puzzlement in this and in many other areas of use. I am currently following the OU first-level French course, L120, and in speaking to fellow students at tutorials have found that, although most produce the text for their assignments using Word on a PC, all but one of them was adding the accents afterwards by hand! Even the tutors had no idea about how to get properly accented French text on a UK word processor.

I guess this is a problem of affordance – the functionality is there but you have to be very determined to find it. A start might be to have information about it in the help system – though I also have anecdotal evidence that many users are completely disillusioned with the help system, and have very little expectation of finding anything useful there.

The keyboard shortcuts for French accents are summarised in an appendix (page 10), for the benefit of those who have not yet discovered them for themselves.

## Multiple ISPs

There is a conspiracy by many ISPs to lock unsuspecting customers into their own service, forcing them to forsake all others. Last week a friend inserted into her PC the free CD widely distributed by SupaNet, and ran the installer.

Twenty minutes later she found herself locked into a dialogue which she did not understand, including questions to which she did not know the answers. So she rebooted her machine – then found she could no longer access her previous Internet Service Provider. Perhaps she was naive to believe that running the installer on the new CD would add functionality and not subtract anything, but I suspect this is a trap many fall into.

A couple of days later I also received the CD. I had a look at it on my Mac, and printed out



the 'ini' file I found, which included the URL of the page for signing up. I went there and created a new email account – interestingly the SupaNet system seemed to know I was on a Mac, but was happy to let me proceed. It also, unlike other ISPs I have tried, allocated a password for me, and so far as I could see, gave no information about how to change it. It also downloaded another version of the 'ini' file, which I saved and printed off. This included the POP3 and SMTP mail server addresses.

I am pretty new to Windows 98, but happened to have noticed the 'Dial-Up Networking' folder at the 'My Computer' level in the folder hierarchy (not in the system controls, where I thought it might have been). Using this, and armed with the phone number, user name and password, it was not hard to set up a new PPP connection to SupaNet.

(In fact I had already set up a separate connection to good old BTClickFree in this way. This is still the simplest of all ISPs to use, because the login name and the password, as well as the phone number, are the same for everyone. And they are given in the ReadMe file on the CD I got from BT a couple of years ago. However, I don't plan to mention them in this article – the system is already quite overcrowded!)

It is clear that on Windows, as on the Mac, you can have as many dial-up PPP connections as you like, though I get the strong impression that many ISPs don't want you to know this. If all you want to do is use the Web, and possibly a Web-based email service, a dial-up PPP service is all you need (and of course one would suffice, but you never know, one day you may be unable to get through, so it is a good idea to have at least one other as backup. I have five – call me paranoid if you like.)

I guess that somewhere in the Windows system there must be stored the IP address of the Domain Name Server. I know where these magic numbers are held on the Mac, but am not sure where they live on a Windows system. Windows 98 of course has an internet connection Wizard, but this is no help in setting up a second or subsequent account. The Wizard always seems to assume that you are setting up a new account *de novo*, further reinforcing the apparent embargo on multiple connections.

In my (very limited) experience of talking to other PC users, I have found there is widespread misunderstanding, which is reinforced by the publicity material put out by ISPs trying to break into the market. In particular, many users do not appreciate the

difference between dial-up PPP access to 'the Web', and a POP3 mail account, or realise that having multiple email 'accounts' (in Outlook Express terminology) or 'personalities' (as Eudora calls them) is quite different from having the ability to connect to the Web through several different ISP providers.

Of course there are subtle dependencies – SupaNet will not let you send mail unless you are connected through their dial-up service, and the return address is your SupaNet address. There are of course good reasons for such restrictions, but not all ISPs are so fussy.

Most importantly, few people appreciate the dangers of running the installer on a CD which pops through your letter box from a free ISP provider. There is no warning on the label that doing so is liable to change your system in ways over which you have no control, and which may be difficult or impossible to reverse.

People need to be made aware that, if you want to sign up with a new ISP, it is much safer to do it yourself. All you need are the parameters which are available either from the ReadMe or 'ini' file on the CD, or from the ISP's web site. As BTClickFree illustrates, it may not even be necessary to open a new account, or enter any personal details at all.

## Empowering users

What's this got to do with HCI, you may ask? I think the common theme is the old one of esoteric knowledge. Even after many years in HCI I still fall into the trap of feeling that if I know something it must be obvious. Once you get there, the struggles and perplexities of the journey are immediately forgotten.

Sometimes ideas and techniques are intrinsically complex, and serious training is needed to master them. But in other cases obscurity and obfuscation may be spread deliberately, if there is profit to be made from keeping users ignorant and disempowered. Or, as in the case of facilitating the production of French text, it was not important enough to the designers to make it clear and simple for the users.

As HCI practitioners and educators, I guess it is our responsibility to empower the users. Ideas about how best to do this are many and various, but I would be glad to hear your thoughts. This could form the basis for a future article.

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## Appendix: Keyboard shortcuts for French accents and diphthongs

### Mac

On the Mac the keyboard shortcuts involve the key labelled 'alt' (on my iMac keyboard – it may have other names on other models). It is between the Control and the Apple (Command) key on the bottom left of my keyboard. If you hold down the alt key and type e, nothing happens. But the next character you type has an acute over it. (It doesn't work for all characters, but certainly for all the ones you need in French.)

Similarly if you hold down alt and type ` , the next character you type thereafter will have a grave over it. For a circumflex, you use **alt-i** before the character. (*Ed: If you do it before a conference you get a trumpet fanfare with virtual percussion.*) And for the c with a cedilla (ç) hold down alt and type c – this time you get it right away.

Occasionally in French you also need an umlaut (I think 'dieresis' is the English word for it), e.g. in names such as Noël or Citroën. In this case you use **alt-u** before the character (I guess because u is the first letter of umlaut, and u is the most common letter in German which is modified in this way).

For the œ diphthong (in 'cœur' and 'sœur' for example), use **alt-Q**.

### PC/Windows

In MS Word on a PC, if you type **Ctrl-'** (i.e. hold down the Control key, then type `), followed by another character, you get an acute over the character, e.g. é or á.

Similarly if you type **Ctrl-`** (the ` is on the leftmost key on the top row – excluding the function keys – of my keyboard) followed by a character, you get a grave, e.g. è or à.

To get the c with a cedilla, you type **Ctrl-,** (i.e. hold down Control and type ,) followed by a c, thus: ç.

To get a circumflex over a character, you use **Ctrl-^** before the character. (Note that ^ is a shifted character – above 6 on the top row of the keyboard – so you need to hold down Control and Shift, then hit 6.)

You can also put an umlaut over a character by preceding the character by **Ctrl-;**, e.g. ä or ü.

To get the œ diphthong, use **Ctrl-&** followed by o. (Note that & is a shifted character, so you need to hold down both Control and Shift, and hit 7).

## Book Reviews

### Stella Mills

*User-Centred Design of Systems*  
Jan Noyes & Chris Baber  
1999  
London: Springer

This book is published as part of Springer's *Applied Computing Series*, which has been developed to 'provide a grounding in theoretical concepts in computer science' and, as such, is 'essential reading for advanced undergraduate and postgraduate students in computing and information systems' (Inside cover). Its authors are well established in the field of usability and user evaluation of systems and the book follows this angle of user-centredness.

It is important to stress that traditional software engineering methods for including the user, such as small systems development techniques, and soft systems methodologies, such as Checkland's and Jackson's work, are rather scantily considered, although prototyping is given four pages. This is not necessarily a limitation as the authors have chosen the traditional approach

of human engineering to systems design. For example, task analysis (Section 7.4) is used to evaluate users' tasks for use in both the development and evaluation/testing stages of the lifecycle.

The book is divided into three sections: Part 1 defines systems and has chapters devoted to *What is a system?*, *Who will use the system?*, *What will the system be used for?* and *What are the main components of the system?*

Part 2, *Developing Systems*, continues the title questions with a chapter on systems design and then four chapters on evaluating the system with users. The data gathering techniques used are, in the main, traditional and can be used at the various stages of the lifecycle.

Part 3, *Deploying Systems*, has two chapters which consider the introduction and use of the system in the workplace. Each chapter has a summary of its main objectives and learning outcomes and three or four selected references are appended at the end of each chapter to encourage further reading.

Examples are used throughout to support the learning experience.

Given that this book was written as a student text, it will certainly be useful to students of human engineering wanting a good overview of techniques available for increasing

participation of the user in the design lifecycle. However, the text does not extend the data gathered by these methods into a methodology for design; indeed, there is little discussion of techniques such as usability context analysis, usability specifications and other formal user-centred design approaches such as may be found in ISO9241 (Part11).

However, the human aspects of user-centred design together with sound methods for gathering and testing this data are covered widely and in sufficient depth for a student to apply, say, task analysis at the relevant stage of SSADM. As a text for students taking HCI, Human Factors and Ergonomics courses, this is an excellent text but it also can be usefully employed by systems analysts wanting to increase user participation in the relevant aspects of the lifecycle.

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advance notice

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# Can You Hear Us

A design laboratory, held at Saltaire, Leeds. June 14th –16th 2000

Report by Andy Dearden

## How to make A Bigger Splash (with apologies to David Hockney & Delia Smith)

Now that the long summer evenings are here, I expect many of you will be thinking about something light and creative to impress your friends. Making something original is challenging, but this recipe seems to work differently each time. Serve the results straight from the pot to capture the complex mix of flavours.

### Ingredients

- 1 3-D designer
- 1 psychologist
- 1 software engineer
- 1 assistive technology support manager
- 1 sociologist
- 1 digital services designer

### For the seasoning

- 1 experienced product design consultant
- 1 specialist consumer affairs adviser
- 1 distinguished academic

## Report

*Can You Hear Us* was a multi-disciplinary workshop tackling the problem of excluded users and mobile communications. The event was organised by the Design Support Centre at Leeds Metropolitan University in collaboration with the British HCI Group, and held in Saltaire near Leeds.

*Can You Hear Us* brought together product designers, 3-D designers, sociologists, architects, interaction designers and a host of other academics and practitioners. Unlike a workSHOP (in which the aim is to present participants research wares to consumers), *Can You Hear Us* was a WORKshop where the participants were divided into multi-disciplinary teams and took on a design challenge. For both academic and industrial participants, the workshop offered an opportunity to work free from organisational constraints and

- 1 Bring your ingredients together in a room. This may be difficult to achieve – the ingredients rarely attend the same events – and when large numbers are placed together, they tend to fly apart or coagulate in uniform disciplinary lumps. Some ingredients may not come because they cannot see where the publication is. Don't worry, keep trying, the results will be worth it.
- 2 Get the ingredients talking to each other. The ingredients may find this uncomfortable as they all use the same words but appear to speak in different languages. This step can be assisted by adding a little alcohol now and again.
- 3 As the mix is developing, ask your ingredients to select an excluded user. If one or more of your ingredients is an excluded user, he or she may be used. If not, excluded users are easy to find in most high streets. If you can't press-gang an excluded user into the room, you



commercial drivers to engage in truly innovative concept design.

The mix of design skills resulted in some novel product ideas. The designs were originally aimed at: elderly people who feel socially isolated; deaf children; visually impaired people requiring a single device for information access, or automated sensing of visual emotional cues. However, as so often happens when you design for excluded users, the ideas suggest high-quality products that could be of use to everyone (Papanek, 1974). See [www.lmu.ac.uk/~dsc/cyhu](http://www.lmu.ac.uk/~dsc/cyhu) for details of the designs.

For me, as an individual, it provided a much richer understanding of the contributions that different disciplines can make to design, and some of the challenges of working in truly multi-disciplinary teams. The experience will change my teaching (hopefully for the better). It will also change my approach to design in the future.

I'd like to thank Steve Hoffman and

may need to get your ingredients to invent one. If you decide on the invented user, make sure your ingredients flesh him or her out into a picture of a real person.

- 4 Leave the mixture and the user together for a couple of days, adding parts of the seasoning at selected intervals, and asking for reports back on the progress of the designs.
- 5 On the third day, turn out the finished results.

Andrew Monk for putting the event together, and I'd like to recommend future similar events to all *Interfaces* readers.

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*Can You Hear Us* web site:

[www.lmu.ac.uk/~dsc/cyhu](http://www.lmu.ac.uk/~dsc/cyhu)

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# Designing movement in interactive multimedia

## Making it meaningful

Michelle Bacigalupi

Before reading this article, it would help for you to view <http://www.kentgallery.com/baylam.htm>, as this image is discussed in the article.

We would have liked to display this image within the magazine, but it proved impossible to clear copyright before going to press.

A few weeks ago, I received an email from a colleague asking me to check out a couple of URLs. He was excited by their use of what we called Kinetic Typography in graduate school, i.e. the movement of text. When he asked me if I had any advice on how to design dynamic web sites, I realized that I am both enthusiastic and cautious about the use of movement in interactive media. Movement is very powerful: used well, it is both satisfying and compelling. But more often, web and CD-ROM designers create flash and glitter, without any substance. They rarely consider their audience nor do they communicate any clear message. Movement is hard to ignore: the eye is drawn to it, even when it is not relevant to the message. Poor use of movement distracts from the user's experience and obscures important information.

As a designer I'd like to share the insights I have gained in working with movement in interactive media. My purpose is to synthesize some of what has been learned in other fields that use movement to create a conceptual framework and to develop a new vocabulary that helps interaction designers successfully integrate movement into their software. This article is based on my Interact '99 tutorial, which offered multimedia presentations and experiential exercises to help participants learn about movement design. The conceptual framework and vocabulary I presented builds upon analytical writings of art, perceptual psychology, philosophy and the movement analysis system of Effort/Shape.

### Why do we need a conceptual framework to describe movement?

How can we use movement well? What was it about the web sites discovered by my colleague that made them so successful? The most important observation is that all media elements fit well together: the music, graphic images and text, as well as the sequence and interaction structure, were woven into a gestalt or whole.

Most of these media elements have independent vocabularies to describe their internal structure. Thus music can be described in terms of how it will be played, e.g. allegro, largo or staccato. Graphic images can be described in terms of perceptual or spatial relationships, e.g. figure and ground. Colour can be described precisely in terms of hue, saturation and brightness. Typography describes the structure of written text, e.g. point size, leading and kerning. Even story telling has a specialized vocabulary, with concepts related to the beginning, middle and end of a story. Interaction designers use principles from cognitive science, particularly those relating to memory and sensory

perception, with their own corresponding vocabularies. Movement, however, does not have a common language or conceptual framework. This leaves us without a reliable way to describe, discuss and analyze movement in order to find what works and to clearly understand why it works.

### Movement: what does it mean anyway?

What do designers need to know to design movement that communicates effectively? The following section explains the elements of movement, drawing relationships with art, dance and the natural world. Reeves and Nass (1998), in their book *The Media Equation*, explain four basic principles that describe how human beings attend to motion:

- Attention is associated with the presence and absence of movement
- Engagement is relative to primitive response to movement (survival)
- Constant motion is a distraction; too much and thinking shuts down (web)
- Variation of activity and rest improves learning

How can interaction designers use movement so that it takes these natural human responses into account?

### Movement qualities

The conceptual framework I developed consists of two main categories of movement qualities: formal and expressive. My model for this is music, in which the basic notes comprise the form, but *how* the notes are played – the expression – greatly influences the experience of the listener. The movement design vocabulary takes these two sets of covariants – formal and expressive movement qualities – into account.

### Formal movement qualities

The covariants of formal movement qualities constitute the basic underlying structure of movement. They include rhythm, tempo, sequence, and direction. Through variation and consistency these four elements build the foundation for movement.

**Rhythm** occurs as a result of intervals from one active movement to the next. The movement must include elements of periodicity or repetition for rhythm to be revealed. An example of a constant rhythm is the Pahu drum beat in an ancient Hawaiian chant. In contrast, variation is eloquently expressed in the jazz work of Miles Davis.

**Tempo** is the time pattern revealed by the cadence in a series of movements. For example, the experience of a Waltz time pattern (3/4) provides quite a contrast to a Salsa or March tempo (4/4).

**Sequence** is demonstrated by a series of events that occur over time. Consecutive elements form a relationship from one movement event to the next. A ball thrown in the air will obey the forces of gravity and come down, with an established relationship between up and down.

**Direction** is shown by movement in space. Certain directions have been assigned meaning, particularly in

western cultures. Up is equated with positiveness while down is associated with negativity. Consider, for example, the expression 'I'm feeling low' or 'I'm feeling down.' Movement to the right is considered an increase in momentum while movement to the left is seen as a retreat.

The four covariants: rhythm, tempo, sequence, and direction, fit together like a puzzle. Each is necessary and related to the others. Rhythm and tempo need repetition, which implies time. Time allows for the emergence of patterns, either varied or consistent, and allows us access to the rhythm(s) and tempo(s) being enacted. When we add sequence and direction, space becomes particularly apparent in its relation to time. Our experience of sequence and direction tells us that the movement occurs in space. Movement that fully integrates these formal movement qualities engages our spatial awareness whether we are viewers of the movement or enacting it ourselves. Our kinetic sense is triggered and our frame of reference helps us understand the relationships of movement to space and time because we carry within us the experience of moving our bodies through this world. We know front from back, up from down, right from left. Unless there is severe limitation of cognitive processing, people with limited movement carry this information in their bodies as well.

### Formal movement qualities applied to art

We can recognize these formal movement qualities in visual art. Bayer's *Lamiferous Landscape* (see [www.kentgallery.com/baylam.htm](http://www.kentgallery.com/baylam.htm)) provides a particularly useful example. It is abstract in form so we don't get overly caught in naming 'things'. Rhythm is illustrated in the patterns created by repetition via the ebb and flow of lines that rise and fall, some in unison, some in contrast. The multiplicity of lines suggests a rapid tempo, except where the eye is slowed by the patches of darkness. The smooth consistency in the rise and fall of the slopes contrasts with the sharp rise and fall next to a peak, providing a complex spatial sequence. Changes in line direction skilfully lead the viewer's eye around the picture, without leaving the canvas. For example, the vertical peak in the mid-left quadrant is balanced by a horizontal line above it, which prevents the eye from continuing upward off the canvas.

### Covariants of expressive movement qualities

When a choreographer creates a new dance he or she designs both the steps and the expressiveness required of the dancer. The composer does the same, composing both the notes to play and the expression desired, e.g. staccato, allegro, or andante. The details of expression, perhaps outside of our conscious awareness, of a Mozart composition or a dance choreographed by Martha Graham leave us breathless.

The designer of movement in software is much like a composer or choreographer. Movement in software can have qualities of eloquence and articulation if the software

designer understands the potential movement has for communicative expression. Just as music played with intentional expression affects the listener's experience, movement designed with expressive intention affects the viewer's experience. The key elements of expressive movement qualities are kinesis and empathy. Kinesis illustrates *how* the movement is expressed, e.g. quickly, with strength, etc. Empathy is the emotional engagement (sad, joyful) or physical identification (large, small) associated with a movement. All things, whether alive or not, have specific movement affinities – styles of movement with certain kinetic and empathetic capabilities. A hummingbird moves with rhythmic quickness and directness, giving the sense of urgency related to its need to eat every few seconds. In contrast, a snail moves slowly with an impression of great effort, projecting the sense of heaviness despite its light physical weight. Its form, much like the hummingbird, does not allow it to move any other way. Hence the term *sluggish* to describe slowness or difficulty getting into motion. There is a close association between physical attributes and meaning. We do not expect large concrete blocks to float lightly to the ground nor feathers to fall quickly. If they act otherwise, we are surprised and see reasons for seemingly contrary behaviour.

Physical attributes play a role in the range of kinetic and empathetic qualities available for expression. (As in the previous example, a snail will not move like a hummingbird and vice versa.) The description of kinesis here borrows from Laban and Bartenieff's (1980) movement analysis system called Effort/Shape. The main ideas include weight, time, space, shape, and flow. Each helps us understand the quality of energy present in a movement (Figure 2). Different combinations of these efforts produce a unique gestalt, or a whole that is greater than each of the parts. For example, if we combine the following:

Weight—Strong Time—Sustain Space—Direct  
we see a figure moving intentionally towards a target, trying to avoid discovery, perhaps a lion stalking a gazelle. Compare this to the following combination:

Weight—Light Time—Quick Space—Indirect  
We might see a figure moving quickly, lightly, and randomly, perhaps a balloon being buffeted by the wind.

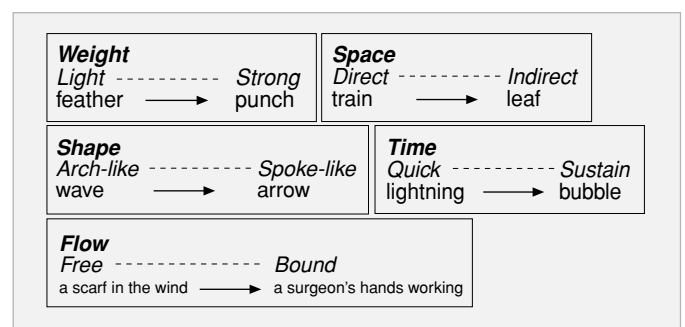


Figure 2



Shape refers to the topology of movement. Just as the topology of a land formation has certain characteristics, so does the path of a movement as it rises and falls, curves and twists through space. The path of movement influences the empathetic experience. The path of a nearby lightning bolt as it darts across the sky engenders a very different emotional response than gentle ripples on a lake as they radiate outward in concentric circles. While we cannot separate these examples from the context in which they occur, they represent how movement, through the qualities of physical actions, can elicit an empathetic response. If we are asked to sway like a willow or move like a cat our movements will be similar to one another's, based on having seen or experienced how willows and cats move.

The empathetic experience has two components: Physical identification includes recognition of movement in the physical world, such as ocean waves, swaying trees, or the falling of a large/heavy object.

Emotional engagement relates physical expressions with emotions such as fear, joy, anger, and sorrow. Picture a person crying, head down, shoulders hunched and a heaving chest. Most of us would assume the person is sad, not joyful. Yet crying can also be associated with joy – what changes is the gestalt of the body gestures.



Figure 3



Figure 4

Physical identification and emotional engagement span a continuum from abstract to concrete (Figure 5). We attribute heaviness to both concrete blocks and large elephants. Emotional engagement is influenced by the extremes of abstraction and specificity, and we may have difficulty becoming emotionally engaged to either. For example, while aesthetically pleasing Bayer's *Lamiferous Landscape* elicits limited emotional reaction as compared to our response to Picasso's *Guernica*, which is an abstraction of human agony.

Through use of implied kinetic movement, form takes on the elements of weight, time, space, shape, and flow that facilitate the realization of empathetic engagement.

The physical gestures in *Guernica* include heads turned back, mouths gasping wide, and arms reaching strongly

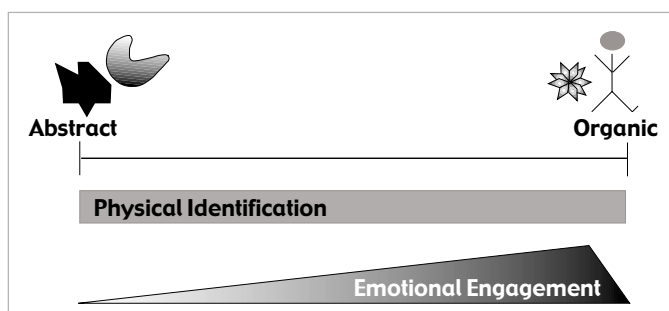


Figure 5



Figure 6 *Guernica*, Pablo Picasso

upwards that combine to promote empathetic engagement with the human tragedy and terror of the event portrayed in this work. The multiplicity of strong diagonals kinetically expresses a quick and repetitive visual tempo and rhythm that moves the eye from image to image in a quick, strong and direct sequence. The viewer is confronted again and again by the short lines and angles that pierce the picture plane.

Laurie Anderson's CD, *Puppet Motel* (Voyager, 1995), is an excellent illustration of complex movement design in interactive multimedia. Variations of both formal movement qualities and subtle changes in expressive movement qualities are synthesized to create perceptual and sensory engagement. The general tone is one of suspense interspersed with small free flow movements of various objects. The feeling of suspension is created through an abundance of sustained and indirect movement with an absence of weight. There is no apparent display of lightness or strength, hence the feeling of weightlessness that gives an aura of intrigue. I think since we are gravity bound this lack of being 'stuck' to the earth is part of what makes this an engaging interactive experience.

Combinations of physical identification and empathetic engagement can be seen in our environment. For example, quick, light, and free flow action might be seen in a toddler as she, with a look of delight on her face, expresses joy running into the arms of her parents. Consider, in contrast, the quick, strong, and direct movement of someone trying to save a glass vase from hitting the floor! As you can see, the fullness of context provides the critical aspect of the situation and supports the communication of completeness of meaning. Foreground and background are interdependent, as are the covariants of formal and expressive movement qualities. Figure 7 summarizes the interdependency of this conceptual framework for completeness in movement design in interactive multimedia.

## Real world applications: where movement supports meaning?

There are examples of movement in the digital world that support meaning. A progress indicator helps the user to know a process is taking place and email animations let us know email has arrived. Michel Beaudouin-Lafon's animation provides the user, with subtle movement, the ability to look under the top page view on the screen to get enough of a hint of what is on the previous page and MarchFirst's web site uses movement to facilitate navigation. *Puppet Motel*, previously mentioned, uses movement to draw us into an ever-changing story. These examples illustrate how movement can range from simple to complex, from entertaining to informational.

Like my colleague, whose questions catalyzed some of the foregoing reflections, we all intuitively recognize what works in movement design even when we have no language to articulate what engages us. In order to create movement that 'speaks' effectively to the viewer on all levels, we need a working vocabulary for movement like the ones that exist in music, art and dance. It is my intention to encourage designers and developers of multimedia to find and use this vocabulary. Hopefully this article will not only be useful in that search, but will impart some of the excitement and urgency I feel for this essential next step of movement design in interactive multimedia.

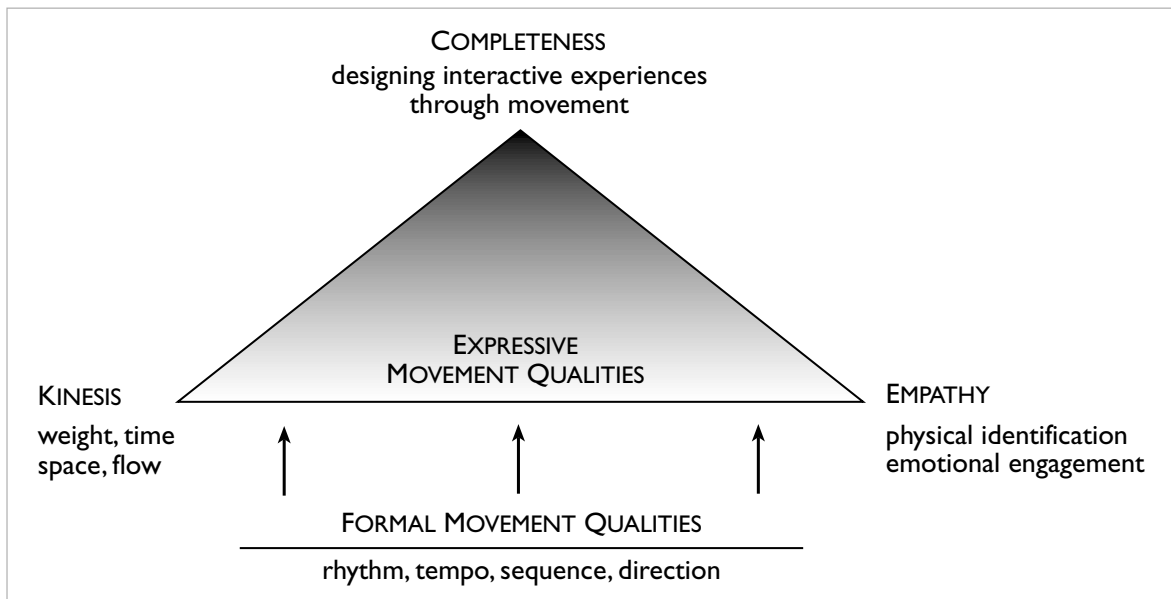


Figure 7

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Picasso: [sunsite.auc.dk/cgfa/picasso/p-picasso23.htm](http://sunsite.auc.dk/cgfa/picasso/p-picasso23.htm)

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## Profile

### David Benyon



David Benyon is professor of Human-Computer Systems and head of the HCI group at Napier University in Edinburgh. From 1987 he was at the Open University where he worked on the Addison-Wesley book *Human-Computer Interaction* with Jenny Preece and the rest of the OU team and on the DTI's *Usability Now!* publication. Also during this time he worked with Thomas Green on developing the ideas of ERMI: entity-relationship modelling of information artefacts.

When he joined Napier, in 1996, there were two HCI lecturers and one senior

lecturer and three HCI modules. Now the HCI group consists of four seniors, four lecturers, three research fellows and six PhD students. From October 2000 Napier will be offering core HCI modules in years 2 and 3 of the degree and four specialist modules in year 4. Of course much of the growth has been fortuitous rather than planned – the multimedia group joined HCI during a faculty restructuring and there were some good people in the right places when posts were advertised – but it has resulted in a vibrant HCI centre. HCI at Napier spans multimedia, activity theory, virtual reality, ethnography, rehabilitation technologies and a whole host of related approaches to understanding and meeting the desires and demands of people. Because of this, the traditional cognitive view of HCI as a person using a computer has been pushed aside in favour of a broader view. This is called the 'navigation of information space' view of HCI. Instead of seeing users as something outside a computer, looking in onto information, it sees people as inside the space, moving through and, indeed, creating their own information spaces. And these are not empty information spaces, they are populated by people as well as information artefacts. Many of these ideas were developed during an EC-funded project called PERSONA that resulted in the 1999 Springer book *Social Navigation of Information Space*. For David Benyon, then, HCI is an eclectic mix of methods and models that focus on people, information artefacts, how knowledge and control are distributed through this system and how people find their way through these information spaces.

*What's your idea of happiness?*

A picnic in a French wood, charcuterie, good bread, a flask of wine...

*What is your greatest fear?*

Large stinging insects spoiling the picnic

*With which historical figure do you most identify?*

Keir Hardie

*Which living person do you most admire?*

Ken must get some marks for persistence and being a thorn in the side of New Labour.

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

I don't have any bad traits

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

Arrogance

*What vehicles do you own?*

A bike and a car

*What is your greatest extravagance?*

Champagne and cake

*What makes you feel most depressed?*

The under-funding of higher education

*What objects do you always carry with you?*

Corkscrew, diary, credit card

*What do you dislike most about your appearance?*

My finger nails

*What is your most unappealing habit?*

Snoring

*What is your favourite smell?*

Hops

*What is your favourite word?*

Jocund

*What is your favourite building?*

The new Scottish Museum looks great from the outside, particularly as the sun sets. Inside it is brilliantly designed with a real sense of space and clever use of walkways and windows that reveal other areas to visit. HCI could learn a lot from the way the museum naturally reveals its contents and provides a pleasurable experience.

*What is your favourite journey?*

Parts of the A68 are nice

*What or who is the greatest love of your life?*

The 'what' is Southampton FC, I'm afraid

*Which living person do you most despise?*

I don't think I can despise anyone, though the usual suspects – Thatcher, Murdoch, etc. – come pretty close

*On what occasions do you lie?*

When filling in profile questionnaires

*Which words or phrases do you most overuse?*

You don't mean that

*What is your greatest regret?*

Supporting Southampton FC

*When and where were you happiest?*

Remember that picnic I was telling you about...

*How do you relax?*

A good meal, nice wine, picnics...

*What single thing would improve the quality of your life?*

Cleaner streets

*Which talent would you most like to have?*

Tap dancing

*What keeps you awake at night?*

My son's stereo

*How would you like to die?*

Lying down





## Not playing but researching

Cassandra Hall

Isn't this Web stuff fun? I don't mean all those worthy sites called *Ask Dog*, or *Inert Box*, but those other bits of the Web that you pretend you don't know about but are the bits you look at when you say you're working and your partner wants you to do something.

I've just been watching a Bulletin Board for an RPG (role playing game, darling) that set me back nearly £40 and requires the home equivalent of a multimedia Cray to play it on.

Luckily, I have the home equivalent of a multimedia Cray so, unlike a lot of the RPG'ers who post to the Board, my game actually runs, runs well and the sound and graphics are out of this world. Eat your heart out *Savaged Dragoon* (Hint for serious academics: anyone who gets that joke knows the Board, so don't believe them if they say they've been working hard this summer, unless it's me, of course).

I remember games when they required the imagination of Dali if you were to stick with them for longer than 30 minutes. The first 29 minutes were taken up with loading the wretched thing. The graphics consisted of blobs, very small and either green on black or white on black. Sound consisted of the odd bleep; and flashing highlighting was the major – oh alright – the only special effect. They were all 2D, as stable as a house of cards on a windy night out of doors and required the patience of Griselda (if you know your Chaucer) and a saint if you don't.

But these new little darlings are amazing. The RPG I'm talking about is 3D, and quite interactive. You can take first person or second person view of the world and that world is huge, explorable and able to be manipulated. You can eat, climb, fight, sleep, swim, sit down, talk and even sail a boat. You can examine things, buy things, sell things and ask and answer questions, and best of all cast spells. Oh, do I love spells!

You have a voice, music, sound effects and play real time. And, no, for the sake of your universities, the RAE and all those papers you'll write without this distraction, I won't tell you which game it is. Besides, I've seen the hate mail on the Bulletin Board if you say that the game runs well on your computer and mine does, of course.

So, okay what's all this got to do with HCI? Well, I'm about to argue that it has a lot. There were a couple of things I noticed during game play. The first is that training for the game is done within the structure of the game itself. It's part of the story line.

A student I discussed RPGs with said he had great trouble waving his sword and kicking his leg. I know the feeling. I can't even do that for real so via a keyboard it is additionally hard. You need two separate controls for that and the key presses are not obvious even when you reconfigure them yourself.

But where this RPG gained was that you started unskilled and the extra abilities developed as the game progressed. You went to training and the trainer told you the keystrokes, so you got to practise them as part of the structure of the story. Oh do I wish that business applications were like that!

The second thing is that the game had extraordinary atmosphere. Some of it takes place in dungeons. I'm not scared of anything you're likely to find in a dungeon (you should see what my university thinks is an office) but the atmosphere really got to me. As I found my way about, solving problems and feeling my heartbeat increase, I noticed how cleverly the designers led players towards solutions.

I've not played an RPG of this kind before, yet I knew very well I was being manipulated towards solving problems, lateral thinker that I am or not.

So why isn't my word processor like that? Why can't my spreadsheet lead me towards the solution? Why aren't they fun? And if both those are unobtainable why aren't both available in lateral thinker editions?

As I watch the Bulletin Board, there is one last aspect that strikes me about the RPG and that's how immersed the gamers are. One gamer, told that he had to ask a companion for the information he needed, said that he'd run off without speaking to that character and rebuked himself for having treated the companion so callously.

They can see that world almost as clearly as they can see their own. They are immersed in the way that readers

can immerse themselves in the fantasy world of a book. And no, they aren't nerds, or techies or sad people without lives, unless I'm all three; they are ordinary folk with husbands, wives, jobs, dogs, and mediocre computer systems, and they are totally enthralled and captivated.

What else have I learned from the Bulletin Board? Things less constructive. The game was shipped in a state that meant often it would not run, there were major software engineering flaws, several patches were released and then finally a new CD was distributed to purchasers.

There appear to be some difficulties still in running the game – it does require a big and expensive system to work effectively. The game is adult rated (there's a lot of violence against mutant rats) so perhaps the Software House thought buyers would have big, powerful systems. But it doesn't say that on the box.

All this makes me sad. Products should be properly engineered and should work. Software Houses don't do software engineering any favours if they distribute buggy software. It makes me sorry because games are perhaps what the general public will see most of and this doesn't inspire faith.

What struck me too was how some of those who posted didn't realise just how difficult it is to produce games like this one. They wondered if they might be able to write their own, even though they'd never even written a line of Basic. Again, I wonder why that should be. Or perhaps the self-same people would consider building a spacecraft or doing their own brain surgery. I bet they all have Swiss Army Knives.

And finally, there's the community of the Bulletin Board with its posters and their humour and camaraderie and yes that was appealing too. There were the fixers, the techies, the Tolkiens, the dreamers, the cheats and the flammers out to shock. HCI can learn a lot from looking at games and watching Bulletin boards. But there again, I have to say that it's all in the name of research, don't I? The boss would go nuts if I told him I played a game all summer.



# Alan Dix's Bluffer's Guide to Java

The irrepressible gurus of HCI sprinkle the fairy dust of their knowledge over the pond-scum like us, in easy to digest tracts of 500 words or less.

A while ago I was walking through a University library when a book cover caught my eye: *The Religion of Java*. For a while I thought this was the latest output from SUN corporate headquarters before I realised it referred to the Indonesian island, but perhaps I wasn't so far off. Java excites passion and devotion, its adherents number millions worldwide and its influence

spreads through non-physical channels to homes and businesses across the world. And at SUN they call their salesmen 'evangelists'.

Java was born from the ideal of a language that would be understood everywhere by all computers, whether powerful or humble. To the outsider this sounds like the rantings of a madman, or a computer scientist, but driven by a great vision and supported in the depths of night by innumerable black coffees, eventually they received the revelation and a lone voice cried out – 'write once run anywhere'. At once the voice was joined by others – 'write once run anywhere'. Again and again the cry went forth until the cavernous programming halls of SUN were echoing, and one amongst them, surely a prophet, said, 'in time to come all the world will join with us a shout – "write once run anywhere"'. But what should they call this world-transforming idea, how to name it? Others before had lesser visions and named their languages after a wise man of the past, a strong and farseeing woman, or random combinations of letters. But these were too mundane, too banal for this the GREAT VISION. Long they contemplated the deep black liquid before them. Like a great eye it swirled, until a brave voice said, 'I know let's call it after the coffee'.

So what does it mean to have a language that you 'write once run anywhere'? Well, to start with you look for an existing language that most computers understand (let's call it C++). Then you change it so that no-one understands it (call it Java). Then you ask people to write Java and translate the Java into something that no computer understands (call it Java byte code). Then on every computer you write a

program that the computer does understand, which also understands the Java byte code (call the program the Java virtual machine, or JVM). With me so far?

Of course, once you have been initiated into the secrets, you will want to know more: RMI (so that Java programs can talk to one another across distances), JDBC (so they can talk to other things), JINI (so they can find out about one another), javadoc (so they can tell you about themselves), reflection (so they can find out about themselves) and, of course, ... Beans. Java Beans are God's gift to programmers. In any other language you may declare a variable in a single line of code:

```
Integer monthTotal;
```

In a Java Bean you write:

```
protected Integer monthTotal;
public Integer getMonthTotal()
{
    return monthTotal;
}
public void setMonthTotal(Integer
monthTotal)
{
    this.monthTotal = monthTotal;
}
```

That's seven lines of code; with productivity measured in lines of code per month, that's a 600% productivity gain just from using Java – wow!

As a seasoned Java developer I too cry with a loud voice: 'write once ... run away'.

---

Alan is known for drinking tea, with only the occasional espresso coffee. As well as being an academic, he is director of two internet software companies – both using Java.

If you have a subject that you would like to bluff about, then email Tom at [t.mcewan@napier.ac.uk](mailto:t.mcewan@napier.ac.uk)

Also, working on the 'don't kid a kidder' principle, if you would like to bluff a retort to Alan, Phil (last issue), or anyone else's bluffer's guide, then get in touch. We're more likely to publish the wittiest than the most scholarly correct.

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