

Interfaces

68 • Autumn 2006

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



The 20th BCS HCI Group conference
in cooperation with ACM



Understanding the experience

Pervasive gaming
Synthesising emotion
Novel interfaces
Designing interaction

Interfacing around the globe: London...Prague...
Montreal...Geneva...Pisa...Birmingham...Düsseldorf



View from the Conference Chair

Nick Bryan-Kinns



It's a beautiful Summer's day in July, I'm on a train with the English countryside whizzing past me, and we've just finished the draft programme for HCI 2006; now is as good a time as any to reflect on this year's conference.

When we proposed hosting HCI at Queen Mary, University of London back in 2003 we thought that we'd shake things up a bit. 'Engage!' we said, so we did, and from a good old survey of the committee arrived at six hot topics for this year's conference: Enthralling experiences; Interactions in the wild; Connecting with others; Mind, body, and spirit; Interactions for me; At the periphery. These then shaped the calls for participation, the conference itself, and even the dancing finger people. Then we made sure that more people than ever could engage with our research and this year have the proceedings in the ACM digital library. Our keynotes this year cut the Engage! theme in four different yet complementary ways. Tom Rodden, Alan Newell, Jude Kelly OBE, and Ernest Edmonds bring a world of experience and insight to bear on wildly interacting with others through their mind, body, spirit at the periphery of me and you in an enthralling and engaging way.

We now have a high quality and thematically tight conference which I really wish to thank all those involved for. It always amazes me how much work goes on behind the scenes to make a successful conference, and this year has been no exception. So, here goes, many thanks to: Adrian, Angela, Ann, Ann, Anxo, Bob, Caroline, Dave, Dimitris, Fintan, Fraser, George, Gilbert, Graham, Helen, Helen, Jenn, Laurence, Marc, Olav, Panos, Paola, Pat, Paul, Paul, Peter, Russel, Russell, Stephanie, Sue, Tom, Tony, Willem-Paul, and William. You know, as always, the roles attributed to people in the committee often only touch the surface of their tireless work and commitment. This is especially true of a name you will find almost hidden away in the committee list – Marc Fabri. Marc has worked ceaselessly on the website, the submission system, the admin system, and innumerable technical issues, and is a veritable treasure trove of information about the ways conferences have been run. As indispensable as a Swiss Army knife!

And then there's the social event on Thursday evening. Oh my! We gave Planet Angel the brief of holding an engaging and lively event for over 200 academics and they certainly have the most spectacular plans. You'll be kicking yourself on Friday if you didn't go, and pinching yourself in disbelief if you did! My train is coming into the station, the conference is coming together, and by the time you read this we'll be in full swing. See you all there! All the best, Nick.

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Editorial

Laura Cowen

It's that time of year again. It's conference season.

Having just attended a mini-conference last weekend (LugRadio Live 2006; www.lugradio.org/live/2006), I still have that knackered-but-inspired post-conference glow. I'm still trying to find the energy to write down all the ideas bubbling around my brain.

That conference, in Wolverhampton, was focused on bringing together the open source software community to share ideas and, also, to meet in person the people that many of the 400+ attendees from around the world had only previously met online. Although I'm not an especially active member of the community and attended as something of a 'hanger-on', I was made to feel welcome in the two days that I was there.

Part of my interest in LugRadio Live 2006 was the organisers' attitudes towards making open source software simpler and easier to use for everyone. Presentations included discussions on the accessibility features in the Ubuntu Linux distribution (www.ubuntu.com) and on how open source software developers should stop focusing on just adding more and more features and look at making their software usable and useful. A keynote presentation by Mark Shuttleworth of Canonical Ltd. (www.canonical.com), who produce Ubuntu, listed what he sees are the problems that need to be fixed in

open source software to make it succeed in the mainstream; a good number of which related to usability (including global usability) and aesthetics.

The thing that I love about conferences is the way they support communities. For many people, annual conferences are the only time that they get to meet up and exchange ideas in person. That's what I've enjoyed most about the British HCI Group's HCI conference over the last four years. The presentations, panels, workshops, etc., are great, but it's the people that make the conference work – both the people who work hard to organise it and the people who attend and participate in it.

So if you haven't yet registered for HCI2006, I suggest you do. :)

Finally, the more eagle-eyed readers will have noticed that John Knight has shimmied up to page 3 in his new role co-editing *Interfaces*. He's done a fantastic job, both this issue and last, and has certainly been key in producing what our Production Editor reckons to be "the smoothest issue we've ever worked on". As you probably know, *Interfaces* is produced by an almost entirely voluntary team, so thank you for reading it and, in many cases, for enthusiastically contributing to it.



Laura Cowen is a Technical Writer at IBM's software development labs 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.



John Knight is a User-Experience Manager in the mobile communications industry. Before this he was Director of User-Lab at Birmingham Institute of Art and Design and has worked as a freelance designer and researcher. John is also chair of the Design for Engagement Conference series which is at NordiCHI this year.

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:

Interfaces reviews: John Knight, John.Knight@intiio.com

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Photo credits: cover Queen Mary, University of London, cover & p10–13 Giorgos Artopoulos, Stanislav Roudavski, p16 IPerG project, p17 OLPC project.

Deadline for issue 69 is 15 October 2006. Deadline for issue 70 is 15 January 2007. Electronic versions are preferred: RTF, plain text or MS Word, via email 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 35–67 can be found on the B-HCI-G website, www.bcs-hci.org.uk/interfaces.html



Deflections

Is inter-disciplinarity possible?

Gilbert Cockton

Paul Dourish's CHI 2006 paper was much talked about. He challenged the stance that ethnographic studies must have *Implications for Design*. One of Paul's declared motives in his paper was to start a debate. Hopefully such a debate can move HCI on to a position based, not only on mutual understanding of the needs and values of contributing disciplines, but also on a common postdisciplinary cause that can transcend and reshape disciplinary inputs.

I will take up two positions either side of Paul. Firstly, I think he was far too gentle with simple minded geeks who think that one can squeeze a tube of ethnography to get out detailed design recommendations. It is indeed unreasonable to expect ethnographers to derive detailed easily actionable design requirements from narratives of human activity. However, it is also unreasonable to claim that any specific design feature will work well without user testing. Even more wishful is expecting design ideas to readily generalise beyond the context of ethnographic studies. Quality does not reside within artefacts. It resides within interaction, and most of all in the lasting impact of interaction.

My second 'other side' position is that there is little point in just accepting any old ethnography about digital technology usage. This is especially the case with the emergence of digital media, since the range of disciplines that now exploit, critique and theorise websites, computer games and mobile devices now covers almost every discipline in the humanities and arts. If we must judge ethnography solely on its own terms, as Paul argues, then the same must apply to HCI contributions from cultural studies, art theory, literary analysis, history, economics and whoever else has something to say about the subject. Such multi-disciplinarity could not have been imagined at HCI's birth from the *ménage à trois* of ergonomics, psychology and computer science. So the question is, how many disciplines can fruitfully cooperate?

What has to give and be given when disciplines work together towards a common cause, and what is that common cause for HCI? For me, the common cause is *design impact*; that is, an understanding of process that relates interaction and the impact qualities of digital artefacts, via their structure, function and content (i.e., their design), to the narrative of their creation, inspiration and evaluation. Thus ethnography can produce accounts of how quality emerges and/or is constructed during interaction and subsequent impact, but such a focus cannot on its own easily extend into implications for *designing*.

Decisions and consequences in contexts are the true heart of HCI. To contribute to this common ground, committed HCI research must have access to both design rationales and histories and also empirical evidence of interaction and impact on quality. The question is thus, if we start from a stance on common ground, whether there can be an effective multi-disciplinary mix, and if not, whether there ever could be any form of *inter-disciplinary* beast, which, by the magic of a changed prefix alone, could have human scientists (among others) working in the cause of design, and designers in the cause of human science, cultural theory or whatever.

I have pondered (and more) over the nature of inter-disciplinary work since my undergraduate days, when I wrote my final year dissertation on the design of integrated humanities

curricula, as an alternative to Victorian 'bastion disciplines' such as History, Geography and Literature. My conclusion almost 25 years ago was that disciplines could not sensibly be fused. They can sit alongside each other in a curriculum process (as in Bruner and Dow's MACOS), but at the close of each activity, students should have a stronger sense of their own understandings and positions, as well as knowledge of the views of others, and the extent to which they can agree or compromise. At the close of designing, however, there must be one design. It can be constructed differently from different disciplinary perspectives, but there is a common cause and locus of decision-making that means that agreement, compromise and resignation will take precedence over individual or disciplinary conscience and conviction.

We cannot conceive disciplines without creating boundaries, whether as bodies of substantive knowledge, of research methods, of questions and concerns, or of values of enquiry and discourse, or a mix of some or all of these. Indeed for many, the whole point of disciplines is to have boundaries (Sayer 1999). From this standpoint, inter-disciplinarity is at best a polite fiction that does little more than provide comfort for those unwilling to take a *postdisciplinary* plunge, as Andrew Sayer advocates:

If people work on a coherent group of topics or problems without regard for disciplinary boundaries long enough ... a postdisciplinary literature builds up ... Urban and regional studies is a good example of this.

In other words, all you need is Common Ground, and yet discussions of inter-disciplinarity tend to favour diversity (Carroll et al. 1994). So get Common Ground, and get going. Cling to senile bastion disciplines, and you will still complain that Discipline A doesn't understand Discipline B and exploits power relations to oppress the worthy. Disciplinary hierarchies and their groupies apart, few care. In contrast, many people care about the experience and impact of computer usage. Relating these to the process of designing should be our priority, and not whether some discipline is getting a fair deal.

Bruner, J. & P. Dow (undated). *Man: a course of study: a description of an elementary social studies curriculum*. Cambridge, MA: Educational Development Center

Carroll, J.M., Van der Veer G.C., Hammond, J., Schneider-Hufschmidt, M., Risak, V.A. and G. Cockton (1994), "Let one hundred flowers bloom in the global zoo" in *SIGCHI bulletin*, 26(4), 4-9.

Dourish, P. (2006). "Implications for design" in *Proc. CHI 2006*, 541-550.

Sayer, A., "Long Live Postdisciplinary Studies! Sociology and the curse of disciplinary parochialism/imperialism" Paper presented to British Sociological Association Conference, 1999, available at www.comp.lancs.ac.uk/sociology/papers/Sayer-Long-Live-Postdisciplinary-Studies.pdf, last accessed 12/7/06

Gilbert Cockton is Research Chair in HCI and Chair of Interactive Digital Media in the School of Computing and Technology at the University of Sunderland. He currently directs NITRO, a £3.6M collaboration between four universities to provide access to expertise and facilities for digital companies in north east England. Gilbert was recently awarded a NESTA fellowship for his work on value-centred design.

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Rebranding the British HCI Group

Andy Dearden
Communications Chair
British HCI Group

As you may be aware, over the past year the Chairs & Officers Group (COG) have been conducting a review of the British HCI Group 'brand'. As a group, our aim is to offer an unbiased, apolitical voice on all issues at the intersection of people and technology, ensuring that the issues of making effective systems are understood, and that the ethical, social and technical dimensions are considered appropriately. We represent academics, practitioners, industry and the general public in dialogue with government, funding bodies, industry, universities, consultants and individuals, through the mass media, through responding to government initiatives, through our online and print media, and, most critically, through the actions of our members.

While HCI is a growing area with many more practitioners than there were 10 years ago, membership of the British HCI Group does not seem to be growing in line and we can see all around the need to develop more HCI influence both in consumer product design, and in the public sphere. ID cards, NHS Medical Records and 'Choose and Book', e-government, Interactive TV, are some obvious examples where HCI has a key role to play. It seems that we are not communicating as effectively as we need to. So how do we increase our profile and our impact?

All the books on rebranding remind us that there is no point in having a new name (Consignia?) and a shiny new logo, and expecting that to change how people see us. We need to review what we do, and how we do it, and then we might adapt our name and logo to communicate the new reality. Over the year we have spent some time examining our current activities and existing 'brand assets'. We have a vast array of titles and faces that we present to the outside world. Examples include: the www.bcs-hci.org.uk website, *Interfaces* magazine, UsabilityNews.com, the annual conference HCI 200X, *People & Computers* – the series title for the conference proceedings, BCS-HCINews@jiscmail.ac.uk and *Interacting with Computers* to name just a few.

In reviewing our activities, we are questioning many things, some of which some of us are personally attached to. Is HCI the best name to reach out to a wider audience? Try saying "I am from the British Human-Computer Interaction Group, which is a specialist group of the British Computer Society" into a radio microphone. It is hard enough just to get the words out, and at the end of the sentence the listener is unlikely to understand what we do!

Some other things we have discussed are: does the word 'group' make us sound open and inclusive, or cliquy and closed? In what senses are we 'British', and what does that word suggest to a wider audience? How well does the annual conference meet our current needs – including both the academic need to publish and exchange research findings, the need for practitioners to keep up to date, and our need to network and meet together? We have thousands of readers of UsabilityNews, but do they think of themselves as 'HCI' practitioners or something else? Indeed, do they know that UsabilityNews is produced by us? Does *Interfaces* need to update its image and production, and how can we make stories more easily available online? How do *Interfaces* and

UsabilityNews relate to each other? Can we bring our website up to date and provide more stimulating content? How do we avoid duplication of work between managing the email newsletter and updating other channels. What do we need to emphasise to increase our commercial income and sponsorship?

Of course, our plans for change have to recognise that we are a voluntary membership organisation. We have no full-time employees. Our executive and COG are all volunteering their time, so proposals for change need to be feasible with our current membership. If you think you can help in any part of our work (producing *Interfaces*, writing or managing online content, maintaining web systems, organising and promoting events, acting as a UsabilityNews advisor, etc.), then please get in touch with us via the membership secretary (Janet Read – jcread@uclan.ac.uk).

As part of this broader exercise, we have also been trying to redesign our logo and our external 'identity'. Currently, we have a group of consultants from Enable Interactive (www.enableinteractive.co.uk) helping us to design a new logo. We have explored the key elements that we want to project about the group, and gone through a series of 'moodboards'. This has been fascinating for me, and fits with my understanding of the role of prototypes in interaction design. After an initial discussion of what the HCI group is about and what we do, the graphic designers at Enable have produced series of graphical 'moodboards' that reflect their understanding of who we are and what we are about. We have responded to them by indicating things that feel right for HCI and things that do not work for us, and they have taken these ideas back to produce revised moodboards, before eventually arriving at some initial concepts for a new logo. We are currently looking at these concepts and will be making a presentation at the AGM in London. Come along to see what's new!

We all share the goal of championing HCI in its broadest sense to improve the lives of all. Please think about how *you* can help to make these activities more effective.



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Andy is communications chair for the British HCI group. He is reader in e-SocialAction at Sheffield Hallam University. His research is concerned with participatory design of information and communication technology, technology design in voluntary and community settings, and applying technology to promote progressive social change.



Enabling user interaction in installation art using mobile devices

Digital installation art can often gain from the capability of detecting the presence of people observing it. With this information, artists can enhance the experience of who interacts with their work. While this detection can be made by means of web cameras or sensors, these systems are generally difficult to implement for people with a low knowledge of programming. We propose a system that uses Bluetooth to do this detection and allows easy integration with applications often used by digital artists. The system also allows users to interact with the installation using their mobile devices. It's intended to be used in art installations by digital artists who wish to give their audience a new way to interact with their pieces.

Introduction

Installation art is art that modifies a particular space in order to give the observer a different experience in that space. It can use any material, physical or digital, and it doesn't have to be done in galleries, public or private spaces can be used. Digital installation art uses digital media – video projections, sensors, web cameras, etc. – to accomplish the desired result.

Digital installation art can often gain from the capability of detecting the presence of people observing the installation. There are many ways to detect the presence of people near an installation. Web cameras with more or less advanced detection techniques can be used, or a wide range of general purpose sensors combined with sensor control interfaces like the I-CubeX system [1]. Implementing these solutions, however, is a distraction to the artist from more important aspects of the installation. Often, these systems mean building special structures to position web cameras and sensors and have to be fine-tuned to every location.

Sometimes, however, it's not really necessary to have a very precise detection system; i.e., it doesn't matter if the system only detects part of the audience. In some cases, the artist is only concerned with providing a dynamic piece that reacts to the presence of people in a room, but it's not important that the piece recognises exactly how many people there are.

We have developed a system for detecting the presence of people by detecting the presence of Bluetooth enabled devices. Our system allows easy integration with applications used for building digital art installations, namely by our students at the School of Arts of the Portuguese Catholic University. The system is called "Digital Arts' Bluetooth – DiABlu"¹.

Our goal was to develop a system that was easy to use and integrate with other applications, like Flash [2], Processing [3], Max/MSP [4], Pure Data [5], etc., by using the widely used OpenSound Control (OSC) protocol [6].

Besides allowing the detection of Bluetooth devices, the DiABlu system also allows users to interact, using their mobile devices, with the installation. Throughout this article we use the names of the main components of the DiABlu system, with the following meaning:

Target Application: The application that is developed by the final user and that needs information about Bluetooth devices. This application can be developed in Max/MSP, Pure Data, Processing, Flash, or any other environment that supports the OpenSound Control (OSC) protocol.

DiABlu Server: The base DiABlu application that connects to the Target Application and provides information about the nearby Bluetooth devices.

DiABlu Client: Mobile application that connects to the DiABlu Server and allows the user to input keystrokes and text messages that will be delivered to the Target Application.

Designing the DiABlu system

The DiABlu system started out from the need to incorporate interaction in installations programmed in Max/MSP and Processing, via a mobile phone. Basically, we had two requirements: to be able to detect the presence of mobile phones and to be able to receive input from those mobile phones. We also wanted to be able to simulate the presence of mobile phones, so that testing the target application would be easier.

One of the main goals was to design a system that was easy to use by our students, and by digital artists in general. This meant that the system should be easily used with applications like Max/MSP, Pure Data, Eyesweb, Flash and Processing and that it should run on the Mac OS X and Windows platforms, since these are the most used applications and platforms in our school.

High-level architecture

The high-level architecture of the DiABlu system is presented in Figure 1.

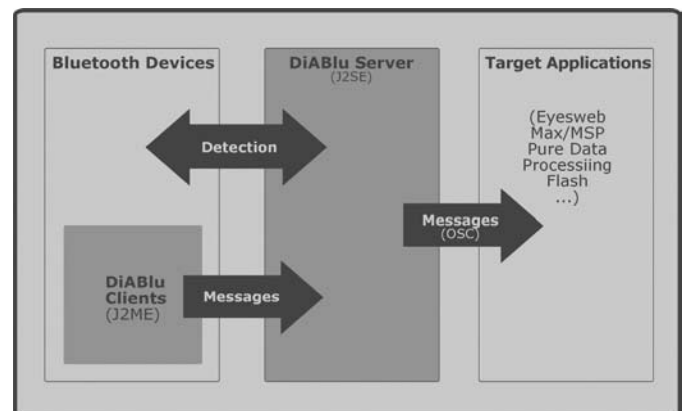


Figure 1 High-level architecture of the DiABlu system. The shaded boxes represent the software components of the DiABlu system.

Basic Bluetooth concepts

Bluetooth is a wireless communication protocol intended to connect low power devices like portable digital assistants (PDA) and mobile phones. Bluetooth transmissions are omnidirectional; i.e., devices don't need an unobstructed line of sight to communicate, and have a nominal range of about 10 metres (class 3 devices). Bluetooth devices are divided into three power classes. Class 1 is intended for larger devices, usually with AC power supply. Class 2 and 3 are intended for small, battery-powered devices. Table 1 lists the power rating and communications range of each power class. Mobile phones are usually class 3 devices.

¹. More information about this project can be obtained at <http://soundserver.porto.ucp.pt/diablo>

Class	Power Rating	Range
Class 1	100 mW	100 metres
Class 2	2.5 mW	20 metres
Class 3	1 mW	10 metres

Table 1 – Bluetooth device power classes

Bluetooth devices are identified by their Universally Unique Identifiers (UUID), which are unique numbers associated with the Bluetooth hardware of the device. Besides having this identifier, Bluetooth devices may (and generally do) have “friendly names”, which are human readable names, normally configurable by the user.

When two Bluetooth devices communicate, three steps have to be accomplished: device discovery, service discovery and communication.

Before communication can occur, a device needs to find which devices are nearby. This process is called device discovery. In order to be discovered, devices need to be visible to other devices. This is usually user configurable, i.e., users can allow their devices to be discoverable or not.

After a device has found another that it wishes to communicate with, it needs to know which services are offered by the device. And there are several standard services like Dialup Networking, Fax and Basic Printing, etc. Applications can also define their own services. Services are identified by their UUID.

After finding a suitable service, communication can begin. Besides the power classes, Bluetooth also defines types of devices (class of device, in the Bluetooth specification), categorising devices in classes like Computer, Phone, Network Access Point, Computer Peripheral, etc. Each class has a set of sub-classes. For example, the Computer class can be divided into Desktop, Server, Laptop, PDA, etc.

The DiABlu Server

The DiABlu Server is the core of the DiABlu system. This application is responsible for detecting nearby Bluetooth devices and informing the Target Application of the number of present devices and their UUIDs and names. Basically, the DiABlu Server performs the following actions:

1. Scan the environment for the presence of Bluetooth devices.
2. Inform the Target Application of the nearby devices.
3. Accept Bluetooth connections from devices and receive data (keystrokes and text messages).
4. Inform the Target Application of the data received.

Incidentally, all communication between the DiABlu Server and the Target Application is made using the OpenSound Control (OSC) protocol [6].

Simulator

An important aspect of the DiABlu system is the ability to simulate the presence and the input from Bluetooth devices.

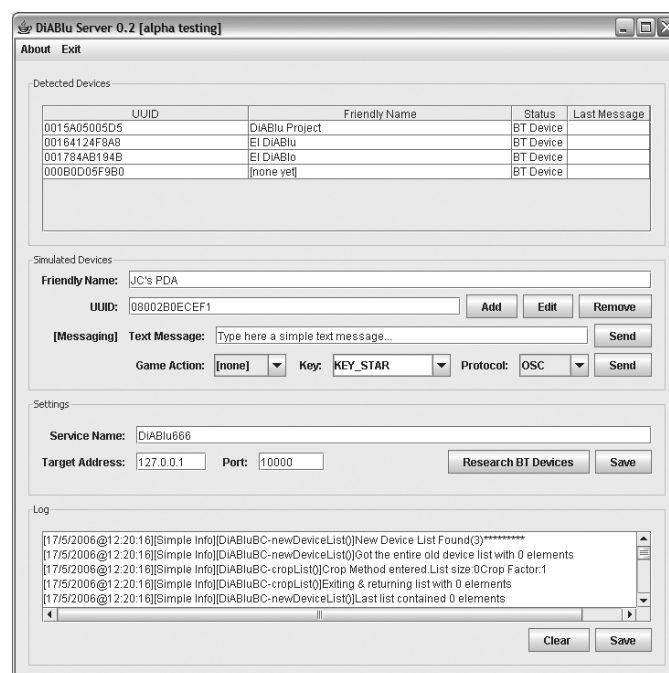


Figure 2 Screenshot of the DiABlu Server interface

Developing and testing applications that use information about the presence of Bluetooth devices can be a difficult task. Reproducing the dynamics of the final environment in which devices enter and leave is very difficult to accomplish with real devices – because of the number of devices needed and because of the rate of visibility change.

In order to facilitate testing and development, the DiABlu Server application also incorporates a device simulator. The application allows the user to simulate the entering and exiting of Bluetooth devices and the input (text messages and keystrokes) from those devices. From the point of view of the Target Application, these simulated devices behave the same way as the real ones.

The DiABlu Client

The DiABlu Client is a mobile application developed in Java ME for devices that support the MID profile plus the Bluetooth Java API (JSR-82) [7]. This application allows the handheld user to interact with the Target Application via the DiABlu Server. The DiABlu Client is a general application, in the sense that it is independent of the Target Application. The application is the same for every Target Application. At present it cannot be customised. Basically, it allows the user to:

1. Discover nearby DiABlu Servers and connect to one. This makes it possible for the user to choose to interact with one from a number of nearby installations.
2. Send text messages to the Target Application.
3. Send keystrokes to the Target Application.

Figure 3 shows the screen diagram for the DiABlu Client application. There are three main screens in the Client application: the

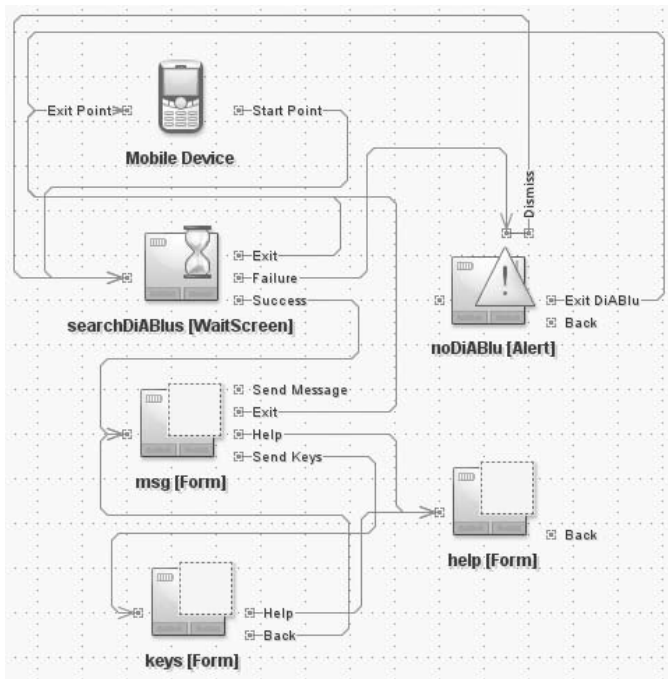


Figure 3 Screen flow diagram for the DiABlu Client

Search Screen, the Msg Screen and the Keys Screen.

The Search Screen is a waiting screen so that the DiABlu Servers can be discovered. To discover a DiABlu Server, the DiABlu Client first searches for Computer class devices. For all Computer devices, the application searches for a specific service UUID. If this service is found, then the device has a DiABlu server running. The service's names (set by the user in the DiABlu Server interface) are shown to the user in the Msg Screen.

The Msg Screen allows the user to send a text message to one of the discovered DiABlu Servers. The user can choose to which DiABlu Server to send the message (if there are more than one). The Keys Screen allows the user to send keystrokes to the DiABlu Server.

The Target Application

The Target Application is any application, developed by the final user of the DiABlu System, that is capable of receiving data via the OSC protocol. The Target Application receives updated information about the names, IDs and number of Bluetooth devices near the computer running the DiABlu Server. It also receives the key codes that a given DiABlu Client's user pressed while connected to the DiABlu System.

Usage scenarios

There are three typical high-level use cases for the DiABlu system:

No interaction: In this use case, the Target Application only needs to know how many devices there are in the vicinity and/or their names. The installation does not have any direct interaction capability; it just reacts to the presence of Bluetooth devices.

Shared interaction: This use case represents all applications that besides reacting to the presence of Bluetooth devices, allow their users to directly interact with the application. Interaction is done

by means of the DiABlu Client application, which must be installed in the device, and is limited to sending keystrokes and text messages. There are no restrictions imposed by the Target Application on the number of users that may be interacting simultaneously with it.

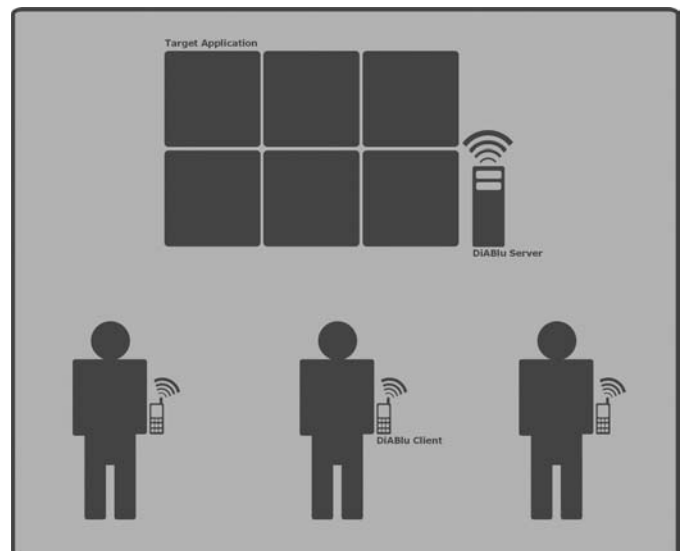
Exclusive interaction: This is similar to the *shared interaction* use case, except that the Target Application limits the number of users directly interacting, to one. This is a typical use case for navigational interfaces in which at most one user may be navigating at a time.

Example Target Applications

Nulltidão (no interaction) is a video installation developed by João Cordeiro [8] that plays with the concepts of crowd and individuality. The installation uses only the information about the number of nearby Bluetooth devices as estimation of the number of people watching it. The installation consists of a video-wall displaying moving images that have been captured by a web camera installed at the location. The video is manipulated so that it shows only regions of the current frame combined with an initial frame. This initial frame is taken from the location when there are no people around. The number of regions displayed depends on the number of devices present.

Public Puzzle (shared interaction) is a video installation that consists of a block puzzle that users can play with. Instead of using a still image for the puzzle, it uses frames taken from a web camera mounted at the location. Playing with this game involves moving a black piece up, down, left or right and thus trying to put the nine pieces in the right order. Several users can play at the same time, issuing commands to the black piece. In order to play, users must have the DiABlu Client application installed.

Jukebox (exclusive interaction) is an application that allows users to select a music file to play, just like a physical jukebox. The application's interface is displayed on a video-wall in a public place. Users can install the DiABlu Client application on their cell-phones and use it to control the jukebox. The jukebox application guarantees that only one user at a time can browse the music library and choose the file to play. This is done via timeouts – if a user starts controlling the interface, other users are not allowed until a fixed amount of time has passed since the last interaction.



OSC messages

The following are all OSC messages implemented by the DiABlu Server. Some of the messages are redundant; i.e., they transmit the same information. They differ only in the way that they must be handled by the Target Application. We chose to provide redundant messages so that the Target Application programming could be facilitated.

/DeviceIn – this message is sent for every new device that is detected by the server. If two devices enter at the same time two messages will be sent.

/DeviceListIn – this message is similar to the previous, except that, if two, or more, devices enter at the same time, only one message is sent. The message contains the UUID and friendly names of all devices that entered.

/DeviceOut – this message is sent for every device that ceases being detected by the server. If two devices leave at the same time, two messages will be sent. This message is the counterpart of the /DeviceIn message.

/DeviceListOut – this is the counterpart of /DeviceListIn. If two, or more, devices leave at the same time, only one message is sent. The message contains the UUID and friendly names of all devices that left the vicinity.

/MessageIn – this message is sent whenever a user sends a text message via the DiABlu Client application.

/KeyIn – this message is sent when the user presses a key in the DiABlu Client application. This message contains also the game action associated with the key that was pressed, if any game action is associated. Game actions are actions like UP, DOWN, LEFT, RIGHT, FIRE, GAME_A, GAME_B, which different mobile phones map to different keys. This way, applications do not need to have a static association between key codes and game actions.

/DeviceList – the DeviceList message is sent every time a device enters or leaves the vicinity of the server. This message contains the list of all devices that are currently visible by the server.

/NameChanged – the NameChanged message is sent when the friendly name of a device changes. This message is important because it allows devices that don't have the DiABlu Client application installed to still be able to have some basic direct interaction capabilities. The Target Application can be programmed to react to certain friendly names, which means that users could interact with it by changing the name of their devices.

/DeviceCount – this message is sent every time a device enters or leaves the vicinity of the server. This message contains only the number of devices currently visible by the server.

Messages are sent only at the end of the Bluetooth discovery cycle, which can last a variable amount of time, depending on the number of nearby devices.

Almost all messages (except for the DeviceCount message) have the [UUID] and [Friendly-Name] parameters so that applications only have to maintain the minimum state information needed. The friendly name could be looked up by the Target Application, using the UUID, but this would mean that the application would have to maintain data arrays, which can be difficult to program in environments like Max/MSP, Pure Data and such.

Implementation status and conclusions

In this article, we have described the general functionality and architecture of the DiABlu System – a Bluetooth detection and interaction system for the digital arts community.

The DiABlu Server has been implemented for the Microsoft Windows and Mac OS X platforms. We are now finishing the implementation of the DiABlu Client application.

We have begun to use the the DiABlu System on projects developed at the School of Arts to gain experience and insight on the kind of functionality needed by our users in order to further develop and enhance the system.

In the short term, we plan to add bidirectional communication between the DiABlu Client and the Target Application. We also plan to extend the detection range by using the DiABlu Clients as detection nodes and transmitting the information about the detected devices to the DiABlu Server.

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A performative situation: Prague Biennale Pavilion

The International Biennale of Contemporary Arts, The Second Sight, was organised and run in the city of Prague by the Czech National Gallery from 13 June until 11 September, 2005. The Performative Space section of the Biennale included an experimental place-specific research project (figure 1) developed in the Cambridge University Moving Image Studio and the Digital Studio of the Department of Architecture.

The design process consisted of three parts. The first part used digital dynamic simulation to produce two organic shells fitting into an existing stairwell space. The second part dealt with the design of the computer-driven responsive audio-visual system. The third part used the outputs of part one and developed them into building components taking into account the performative requirements of the audio-visual system.

Interactive media

Four video projectors cast moving images through the surfaces and onto the walls (figure 3[A]). People come into the light and cast shadows. Reflected off the plastic skins, the light becomes polarised and the space is enmeshed in green and purple (figure 3[B]). On the walls, the shadowy silhouettes of the cardboard cells encase the liquid-like forms of vibrating refractions.

The moving images are derived from dance, urban life and biology, three distinct themes that, intuitively, have little in common. Surprisingly, as they merge and mutate, they constitute an exploration of recurring and visually apparent patterns of complexity, growth and self-organisation. In parallel with the visual rhythms, the sounds and melodies fluctuate; sometimes quiet, then aggressive, never exactly the same.

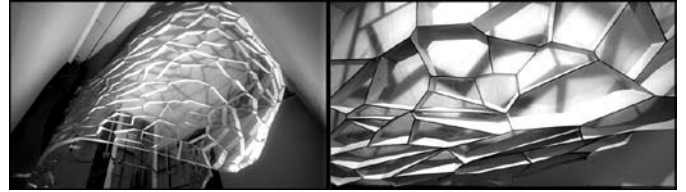


Figure 1 Structure installed in the stairwell and a fragment showing local curvature-dependent variations (photographs).

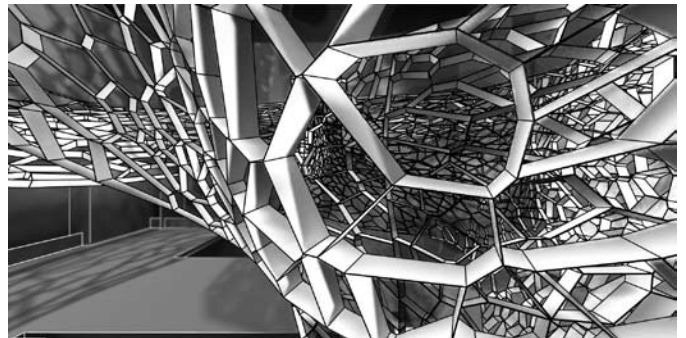


Figure 2 Side view of the structure with the lift shaft removed (digital rendering).

Pattern selection and sequencing in visuals and sound are governed by the movement in space. As people walk onto the 'stage' before the lift (figure 8[C]), their positions and movement determine the composition and energy of the interactive response.

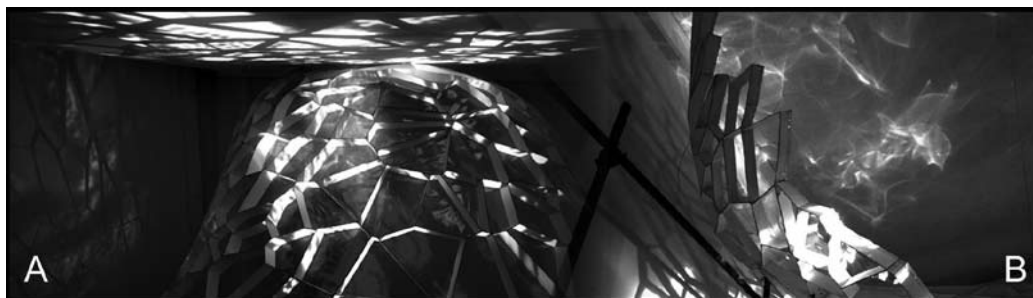


Figure 3 [A] The effect produced by the responsive audio-visual system. Moving images were projected onto the structure and through the structure onto the walls so that image patterns and shadows merged into a continuous field able to integrate bodily movement. [B] Emergent reflections and refractions were colourised purple and green due to the polarising effect of the transparent-plastic cell-skins. The colour depended on the orientation of the cell-skin in relationship to the projector beam (photographs).



Figure 4 Three views of the stairwell space prepared for the construction (photographs).

Design

The complete form of the 'mature' Parasite consists of two organically shaped, topologically cylindrical shells suspended in a stairwell space in the Museum of Modern Art in Prague (figures 7 and 8). The shells consist of 1,510 unique cells (figure 11[C]) that are 'grown' in a digital-simulation environment in a multi-stage process. Crucially, this process attempts to explore and generate a non-trivial solution, rather than express an author's inner world.



Figure 5 View of the structure photographed during construction (photograph).

Multiple dynamic fields were set, positioned and adjusted as the simulation was run through multiple iterations. When an acceptable intermediate shape was arrived at, an array of dynamic particles was distributed along the surfaces that were squeezed to fit into the stairwell (figure 6[B]). The distribution and form of the cells was arranged via multiple iterations in response to more constraining conditions. From this point, our task was to reach from the virtual to the real.



Figure 6 [A] Fragment of the locally variable Voronoi-cell structure conforming to the shape of the dynamic surface (digital rendering). [B] The outer shell in construction on site (photograph). <1> Disused lift shaft. <2> Video projectors.

Condition

The installation in the Museum of Modern Art is but one extended moment in the Parasite's life. The Parasite lives on from broad cultural paradigms, through the interests of its 'authors', through its painful formal birth as a virtual structure, towards its part-real, part-imagined coming-of-age as a dramatic eruption in a gallery in Prague, and further on towards inescapable disintegration and oblivion. In the Museum galleries, there is a body that is about to come together. There is movement and voice, there is physical form beginning to take place. However, the integration is incomplete. The story is still in progress, still alive. The body-structure is a sequence punctuating the space from the side-entrance (figure 8), through the stairwell and into the cinema downstairs.

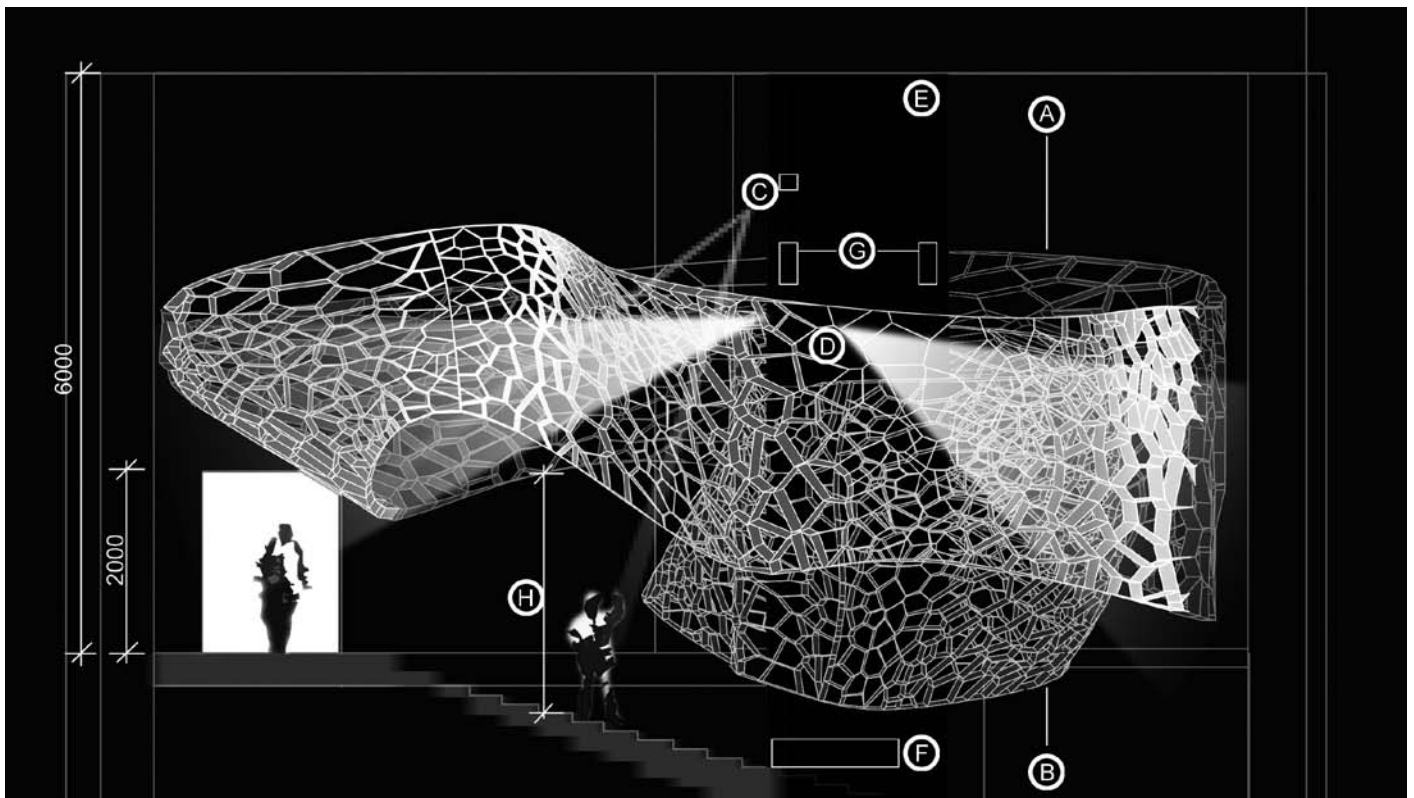


Figure 7 Side view as designed. [A] Outer shell. [B] Inner shell. [C] Approximate area observed by the computer-vision system. [D] Video projections. [E] Disused lift. [F] Computers and the sound system. [G] Speakers. [H] Free passage is left unobstructed all the way along the stairwell. (digital rendering)

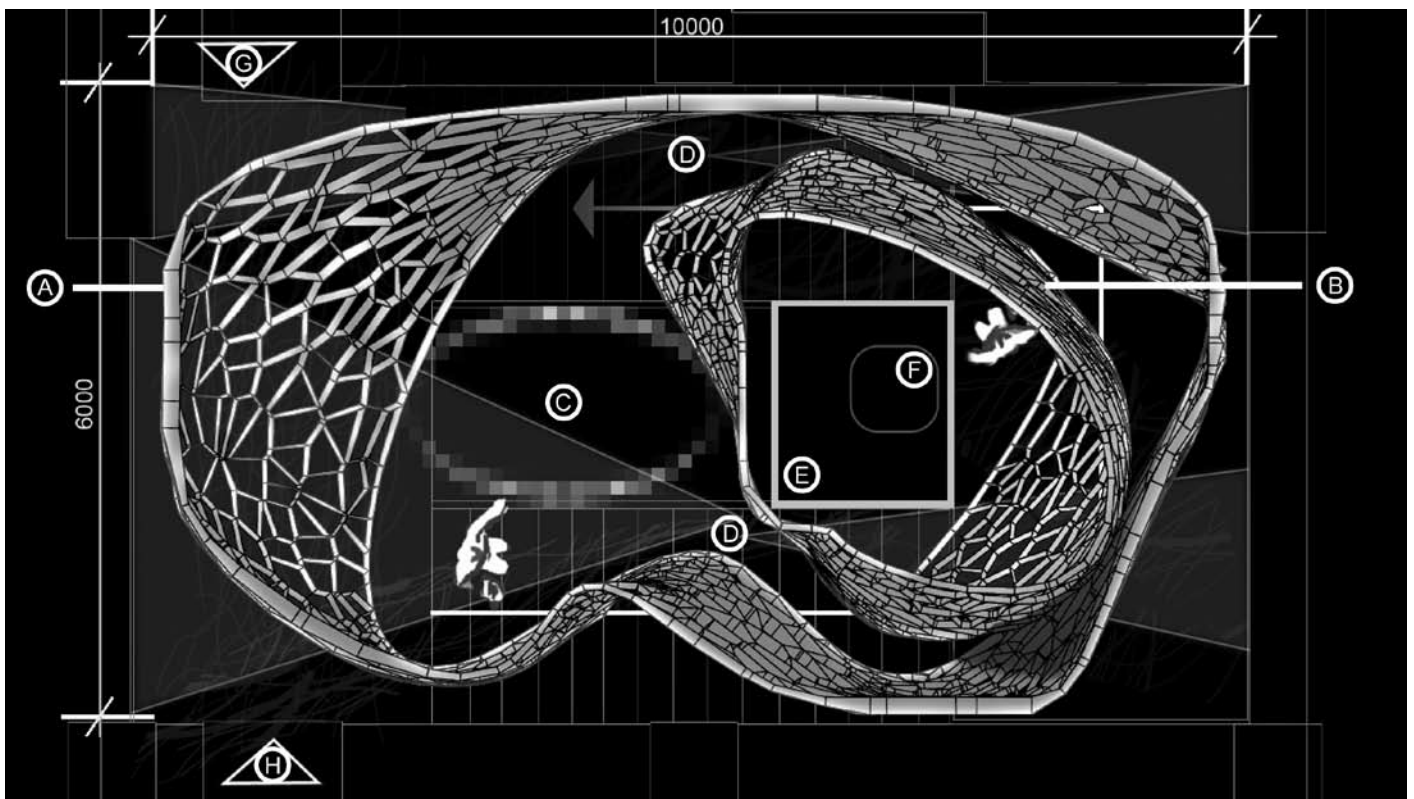


Figure 8 Plan view as designed. The major form was driven by dynamic curves. The flattened areas along the walls were produced by particle systems. The outer shell had curvature-based cell-wall width differences obvious along the top rim. The inner shell had a constant cell-wall width. [A] Outer shell. [B] Inner shell. [C] Approximation of the area observed by the computer-vision system. [D] Video projections. [E] Disused lift. [F] Computers and the sound system. [G] Doors to the Main Hall. [H] Street entrance. (digital rendering)



Figure 9 A perspective into the stairwell (digital rendering).

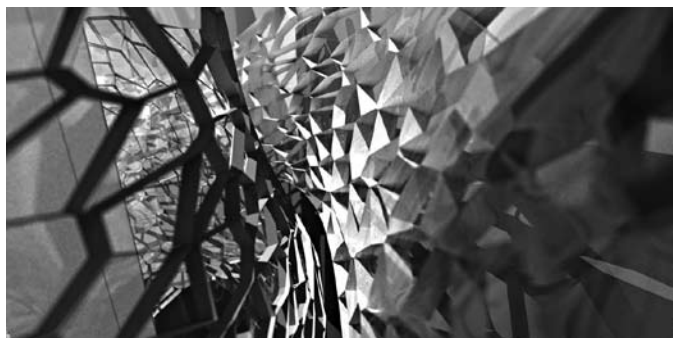


Figure 10 A perspective along the direction of the inter-shell canyon (digital rendering).

Construction

The details were drawn flat and prepared for manufacturing. The cell-walls were laser-cut by computer-driven machines (figure 11[A]). The plastic skins were plotted and prepared. The components were then brought to the Museum galleries and the assembly work began (figure 11). Finally, after many metamorphoses and temporary dwellings, the shells condensed into the patches that now occupy the exhibition spaces (figure 11[F]).

Acknowledgements

G. Artopoulos and S. Roudavski were responsible for the production, direction and the bulk of work on the project. However, the project would not have been possible without the generous help of more than fifty people. In particular, we would like to mention content contributions from Andrew Kudless (programming), Chris Rogers (interactive system development and programming), Panos Demopoulos (sound), Iannis Artopoulos, Popi Iakovou and Nikon Microscopy (USA) (source images). We are also grateful to the following organisations for financial support: James Cropper (UK), Kappa Attica (UK), Automated Cutting Services Ltd. (UK), Buro Happold Engineers (UK) and several Cambridge University bodies (CUMIS, Kettle's Yard, King's College, Queens College and Worts Fund Committee).

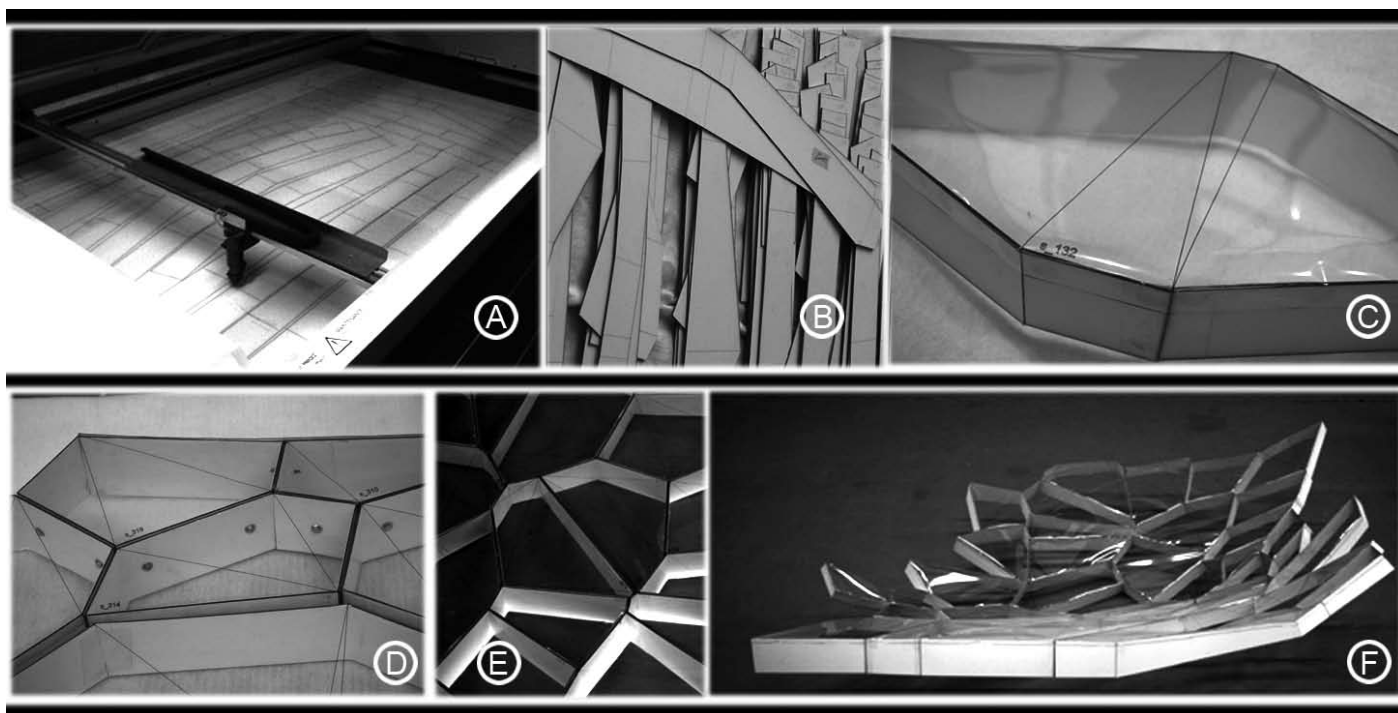


Figure 11 Strips, cells and patches. **[A]** A cardboard sheet cut and scored by a laser-cutter and sorted for assembly. **[B]** Cardboard strips to be assembled into cell-walls. **[C]** A cell with a cell-skin attached. **[D]** Cells assembled with hot-melt glue and reinforced with nuts and bolts. **[E]** A fragment of a cell-patch. **[F]** A cell-patch (photographs).

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A critique of Pattern Language Markup Language (PLML)

Patterns (Alexander, 1979) are abstractions of knowledge acquired from experience in solving recurring problems in a variety of domains, including HCI (<http://www.hcipatterns.org/>). A pattern language is a collection of related patterns that work cooperatively to solve a larger problem. We need a suitable representation for both an individual pattern and a pattern language (Kamthan & Pai, 2005) in order to manage them, disseminate them, and to re-purpose them (say, for presentation in different delivery contexts).

The Extensible Markup Language (XML)¹ can serve as a meta-language that lends a suitable *syntactical* basis for expressing software patterns (Kamthan & Pai, 2005). Indeed, the use of XML has been endorsed in Borchers (2001). The Pattern Language Markup Language (PLML)² (Fincher, 2003) was created with the goal of bringing together disparate efforts at representing HCI patterns. The latest published version, which is discussed in this article, is Version 1.1.

Since 2003, PLML has appeared in the literature in various places (Schümmer et al., 2004; Guy, 2004; Gaffar, 2005), and has been used to express patterns (Latapy, Lopistéguy & Dagorret, 2004) and as a serialisation syntax in pattern tools such as IDE-ALXML³ (Montero et al., 2005).

PLML, however, suffers from certain technical limitations, and the purpose of this article is to bring them to light. It is our hope that the critique will be useful for those who plan to adopt PLML in future contexts. The following discussion assumes a basic knowledge of PLML and XML on the part of the reader.

PLML in perspective: issues and resolutions

Language expressivity

The grammar of PLML is based on the XML Document Type Definition (DTD) which, despite being an ISO 8879 standard and having a relatively low learning curve, has well-known weaknesses with respect to structure and data type constraints. For example, a defining characteristic of a pattern is the 'Rule of Three' (that is, at least three *distinct* known uses), yet such a constraint cannot be declared in PLML. Also, it is not possible to enforce a specific date/time standard in `creation-date` and `last-modified` elements in PLML.

In spite of the claims (Gaffar, Seffah & Poll, 2005), XML (and by reference PLML) has little to offer with respect to the *semantics* of the domain it expresses. Furthermore, the semantics in PLML are informally documented externally to the XML DTD and, therefore, are not available to processing tools.

Grammar design

The design principles behind the PLML DTD are not specified and are unclear. A minimally conforming PLML document is not given. *The optionality in declaration of some of the elements (like problem?, context?, forces?, or solution?) that are considered mandatory in patterns literature, is questionable.*

The content specifications are defined in a manner that increases the potential for making errors when specifying a PLML

document. For example, there is broad use of `ANY` in content specifications like `<!ELEMENT diagram ANY>`, which simply means that a `diagram` can contain any child element or parsed character data, or both. That content specification could lead to `confidence` or `literature` being children of `diagram`, which is not what one wants.

The labels used in PLML to name elements and attributes are not consistent and do not seem to follow a convention: they appear as a mix of singular and plural elements (for example, `author`, `diagram`, `forces`, and `related-patterns`). Related to that, although PLML assumes that there could be multiple `forces` or `related-patterns`, the pattern has only one `author` and one `diagram`.

By claiming that '[to] detail related patterns, you have to link to them', PLML assumes that linking is the only approach to express relationships. However, such links are merely structural constructs based on the author's discretion and do not carry any special semantics. Therefore, their correctness cannot be automatically and rigorously verified. Also, XML in general is weak for recording relationships. For example, it does not provide any means for specifying the properties of relationships, which would be important for a collection of patterns being expressed as a *language*.

Support for heterogeneity

It is common for pattern descriptions to include fragments from external sources. For example, the PLML description states that the content of the `illustration` element could include a screenshot or a photograph, both forms that are usually binary. However, it is not mentioned if they should be included within a PLML document (which is non-trivial when binary) or linked externally. Moreover, it would again be non-trivial to include non-PLML markup fragments in a PLML document without raising the potential for conflict among element and attribute names.

Potential for reuse

PLML does not make any concerted effort to reuse the features provided by other existing vocabularies. For example, it reinvents the definitions related to pattern management and linking. On the other hand, it does not mention how a PLML instance could be used in other contexts. The result is that PLML documents will become isolated islands of data.

Internal documentation

The PLML DTD does not provide any documentation, which is necessary for future maintenance. In fact, the PLML description or the XML DTD does not even specify the root element (`pattern`) of a PLML document. Although it may seem intuitive to some, identification of the root element in XML DTDs is not automatic and is based on the author's discretion unless specified otherwise.

Apart from addressing the aforementioned issues, there are other directions that may improve future versions of PLML.

The approach to the language could be systematic like in Pai (2002) where it goes through the basic phases of knowledge acquisition, requirements, design, implementation, testing, and documentation. Specifically, it would be useful to carry out a feasibility study and then formulate a plan.

¹ <http://www.w3.org/XML/>

² <http://www.cs.kent.ac.uk/people/staff/saf/patterns/plml.html>

³ <http://www.info-ab.uclm.es/personal/fmontero/idealXML.htm>

This could be followed by a design- and implementation-independent conceptual model of the language that captures knowledge of the domain of patterns and of the domain to which the pattern has been applied. The grammar could be strengthened, for example, by basing it on XML Schema.

To support processing agents, including conforming parsers, PLML could also provide a media type (say, `application/plml+xml`) and file name extension (say, `plml`). PLML should also declare a namespace name based on the mechanism of namespaces in XML, thus making it possible to create heterogeneous documents that unambiguously mix elements and attributes from multiple different XML documents.

Once the namespace name is decided, the design of PLML could benefit from the reuse of Dublin Core Metadata Element Set (DCMES) that provides support for metadata (such as author or version information) and the XML Linking Language (XLink) to support sophisticated linking where necessary.

For the purposes of presentation on different devices, it would also be useful to create down-transformations (say, style sheets) to the Extensible HyperText Markup Language (XHTML, a recast of the HyperText Markup Language (HTML) in XML), or other similar languages. Finally, to improve comprehension of the language, all efforts must be supported by internal documentation (support for which is provided by most grammar languages for XML).

There are authors (such as (Tidwell, 2005)) who use their own forms to describe an HCI pattern. In general, such a possibility is always likely to exist. Therefore, the search for a 'standard' for management and dissemination of HCI patterns needs a compromise on both sides. One way to do that would be by providing a core set of elements of a pattern that is labelled as mandatory and an optional set of elements that an author can choose from. Still, this is only a fixed-grammar-based solution; a discussion of providing a means for extending a given grammar by a set of not-yet-conceived set of elements is beyond the scope of this article.

These efforts will still lead only to a representation of HCI patterns as message carriers, *not* as knowledge entities (Kamthan, 2005). For the latter, we need more expressivity which is beyond the current scope of XML.

Conclusion

There are potential benefits in formalisation of software patterns, and PLML is one effort in that area. However, a formal description can fall short of expectations, or even be counterproductive, if not approached in a systematic manner.

In its current incarnation, PLML is not a suitable means for representing HCI patterns. It must evolve in the direction of expressivity, cleaner design, and improved documentation if it aspires to reach the status of a broadly-accepted 'standard'. In general, an *engineering* approach to PLML is desirable, and the issues discussed here will hopefully open avenues for further developments in that direction.

Acknowledgements

The author would like to thank Hsueh-Ieng Pai (Concordia University, Canada) for useful discussions and Sally Fincher (University of Kent, UK) for comments and detailed feedback.

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Guten Tag

With the World Cup in full swing it was not the most sensible time to be moving to Germany to take up the second part of my ERCIM Fellowship at Fraunhofer. However by cunningly using a Luxembourgish registered car it was possible to slip past the border guards without arousing suspicion that I was there to support any football team. Moving on, this edition's column takes a brief look at some interesting topics in HCI research, namely pervasive gaming, along with a discussion about how HCI can perhaps contribute towards improving the lives of the disadvantaged. For those of you looking for some travel advice there is a small section about Geneva at the end.

Pervasive gaming

On arriving at Fraunhofer I was greeted by people walking around doing strange things. I was told this was due to a study which was taking place as part of the IPerG project. IPerG is an EU-funded project, which, among other things, is developing a range of pervasive game showcases and carrying out studies into the effect they may have on society. It is co-ordinated by The Swedish Institute of Computer Science and includes members such as the Collaborative Virtual and Augmented Environments (CVAE) group at Fraunhofer FIT as well as The Mixed Reality Laboratory at Nottingham University, Nokia and Sony NetServices. The IPerG consortium is seeking to develop and test pervasive gaming technologies. As part of the project they are developing five types of game:

Cross-media Games – these bridge the gap between different media channels (devices) and spaces, and include the Epidemic Menace game, which was studied during the two-day session at Fraunhofer.

Socially Adaptable Games – explores how games can become part of the everyday social environment.

Massively Multiplayer Reaching Out – these are essentially massive multiplayer online roleplay games set in a ubiquitous context.

Enhanced Reality Live Role-Playing – uses technology to enhance live role-playing.

City as Theatre – artistic games which take place in city streets.

IPerG: Epidemic Menace

Epidemic Menace is a cross-media game where players try to thwart the ambitions of an evil scientist who has created a mutating virus. If the virus is not stopped, then it escapes from the locale, in this case the Fraunhofer campus Birlinghoven, and spreads to the rest of the population. The players are equipped with a variety of devices such as mobile phones, augmented reality systems, game boards and communication systems. The game can be played in the physical environment (see figure 1) using mobile devices, and it can also be played in the team headquarters using stationary devices. Augmented live video streams are available via the website which allow spectators to watch the game. Each gaming interface uses a



Figure 1 Two participants taking part in the Epidemic Menace study.

variety and in some cases different methods of indicating a virus is present including sounds or visual cues.

Figure 1 illustrates some participants in the Epidemic Menace game outside Schloss Birlinghoven on the Fraunhofer Campus. They are seeking out and destroying the large augmented virus which is in front of them. The participants are wearing a laptop computer and monoscopic display and are carrying a wireless device, which is used to destroy the viruses.

Exploring the differences between each gaming interface was one of the key aims of the study. For example, it was important to know whether participation varied according to using a stationary or mobile interface. In order to achieve this the study examined the effect on the overall user experience, including aspects such as fun and ease of use as well as collaboration and interaction. It is too early to provide any results from the study but hopefully some of them will be published in due course.

Other projects with which CVAE are involved are PEACH, an EU co-ordinated action to support the presence research community, and IPCity which looks at mixed reality. There will be more on these and other research projects in future issues.

Europython and the \$100 laptop

Europython 2006 (Geneva) is not the place you would expect to find many HCI people; indeed I was in the minority and my attendance was due to presenting a paper. More about 'Why Python?' later, but for me the most exciting aspects of the conference were a talk by Leif Oppermann of Nottingham University on IPerG and a keynote by Alan Kay. The latter seemed a little out of place at a programming conference, and



Figure 2 A prototype of the \$100 laptop; this version is powered with a hand crank (right).

he advocated giving computing back to the users and not the techies. His talk on the \$100 laptop (figure 2) made me ask some questions about what contribution HCI can make to the lives of children and adults in poorer countries.

The \$100 laptop project is chaired by Nicholas Negroponte, has the support of the UN and many leading IT vendors, and includes some of the great computing thinkers. The specification is somewhat basic, for example it has only 128MB of RAM and 512MB of flash RAM (in place of a hard disk) although it should be more than sufficient for its purpose. Among its interesting design features are a longer than normal trackpad, which can be used to improve writing skills, and a colour/mono display – which is usable even in bright sunlight. Because of the potential lack of electricity in some areas it will be powered using some form of hand or foot driven device. The crank (shown in the picture) is being replaced with something more appropriate.

Negroponte has indicated that the objective is not so much to provide a laptop as to give a user experience that promotes



Figure 3 The Sugar GUI used on the \$100 Laptop.

learning among disadvantaged children. Much of the project is driven by Seymour Papert's constructionist learning theories, or rather learning by doing rather than learning about. In addition to educational benefits, the laptop will become a focus within the family and community. For example it could enable villagers to communicate and exchange information about where and when to sell their produce – something which is not so easy or possible at present. Therefore, while the driving force of the laptop is educational, it will provide financial and social benefits to the wider community.

Much of the interface, known as Sugar, has already been prototyped (see figure 3), but many areas remain where HCI can make a positive contribution. For example, CSCW theories could be useful in developing simple systems that can support the nature of group work and instant messaging within and between communities. Other areas where HCI can provide a major impact include educational applications, software and studies of use of IT in similar contexts and even of the \$100 laptop itself. Regardless of what the interface is for, the key to making it successful is minimalism, i.e. avoiding complex multimedia and large memory requirements.

So is it time for all those HCI theories to be put to good use? I would argue that the \$100 laptop is perhaps one of the best ways to bring together many aspects of HCI theory and practice in a way that can make a real contribution. Indeed I am sure many of us have suffered at the hands of some of the GUIs developed for open source applications, and perhaps it's only fair that we try to avoid inflicting similar pain on the army of \$100 laptop users. Moreover, with 5 to 10 million laptops planned for the first year, and 150 million within the first few years, the potential impact is enormous. It would be a shame if we had all these grand ideas on how to make things user friendly, yet let the opportunity to make a real change in people's lives slip through our fingers. I am not suggesting that we all start new projects to develop widget A or application X, but rather that we embrace projects that are destined for the \$100 laptop by providing help and advice on good user interface design. If you are interested in exploring the GUI you can download the prototypes, but you will need some knowledge of Python.

For those interested in Python, it is rather a nice programming language. Although it lacks good GUI prototyping tools at the moment, there are some promising sounds coming from the likes of PythonCard and some other free GUI editors. Also the range of third party libraries make it easy to develop (semi)functional prototypes that rely on aspects such as databases, instant messaging, games engines and graphics. Give it a while and a decent set of GUI tools and I am sure it will be one of the preferred platforms for rapid prototyping.

Tips for travelling academics: Geneva

While in Geneva I recommend a quick visit to the lake and the old town district. The old town has some really nice bars, restaurants and a square which are worth visiting. Although be advised, under no circumstances agree to go shopping there on behalf of the partner who may be stuck back home, unless of course you are a highly paid professor. As all you will



find is Versace, Gucci, Prada and other similar budget brands. However you may be surprised to hear that the quality of food in Switzerland (certainly on the budget I was on) was worse than in Luxembourg. Hence try to get some tips from the locals before eating out.

Useful links

One Laptop Per Child (\$100 laptop): laptop.mit.media.edu

IPERG project website: www.pervasive-gaming.org

Epidemic Menace website: epidemic-menace.de

Acknowledgements

Images of the One Laptop Per Child and associated user interface are used under the Creative Commons licence and some rights are reserved. The author acknowledges the assistance of Irma Lindt of Fraunhofer in writing this article.

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The changing face of HCI

Karl Smith

Recent collaborations into physiological studies such as ergonomics have greatly assisted the development of HCI and given a higher profile to considerations of context. Contextual usability, like its precursors contextual design (Beyer & Holtzblatt, 1998), and specifically contextual enquiry, aims to inform and evoke questions regarding real world and holistic data acquisition and their influence and shaping of the results of human-focused research. While usability studies in a laboratory environment offer an immediate practical and basic response level of data, "If I press this, this happens", they are limited to a singular view of activity. As technology becomes increasingly mobile and embedded, its specific context adds a definitive view to real world usability, function and fitness for purpose.

Derek Nicoll (April, 2006) notes that while context contextual research is difficult to conduct the results are rich in qualitative data including insights into dynamic socio-political interactions and how they evolve. His insight into the value of such a revitalising view of ethnographic research evokes the potential for rapid integration of numerous currently disparate disciplines into HCI and usability practice.

In many academic circles HCI practitioners have become the black sheep of the family by attempting to translate research into useful methods and tools for clients with real world needs. This transition from research to practical application retains elements of conflict as the negotiated resultant method is rarely a straightforward interpretation of the researcher's conclusions. However it is essential that practical applications are not thwarted by internal differences but are developed in concert between academics and practitioners.

The HCI community has drawn many useful elements from other disciplines but until recently has not considered the effect of this either in educational institutions, research or in practice. Theoretical maelstroms and fads have not assisted the sense that HCI has no clear destination, no matter how interesting the data or well attributed the case. Don Norman's

recent observation in *Interactions* (vol. 13:1) that HCI has no formalised metrics such as design has with ergonomics and anthropometrics, underwrites the requirement for a new perspective in the domain of HCI. HCI is no longer only seeking its place in the world but is trying to define its continuing relevance, redefining its impetus and observing a changing context of research and practice.

Beyer, H., & K. Holtzblatt (1998). *Contextual design: Defining customer-centered systems*. San Francisco, CA: Morgan Kaufmann Publishers.

Nicoll, D. W. (April 2006). Television and the experiential fabric of the 'domestic' and the 'everyday'. CHI 2006 Workshop IT@HOME. CHI '06 extended abstracts on *Human Factors in Computing Systems*. New York: ACM Press.

Norman, D. A. (2006). People: the way I see it Interaction design is still an art form: ergonomics is real engineering. *Interactions* 13:1, 45–60. New York: ACM Press.



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Writing as third-order experience

Alan Dix

Writing is hard. If you write anything, academic articles, poems, letters to your mum, you know what I mean. But with writing, as with many things, if you understand what is going on, you can find ways to help yourself. So why is writing so hard? As the poet said, "let me count the ways ..."^{1,2}, but let's look at just one reason: third-order experience.

Some years ago I visited Pisa for the first time, or rather I passed through Pisa stopping briefly at the railway station *en route* to the airport from a meeting at Marina di Carrara where the marble meets the sea. Of course, the one thing I had to do was to see the Tower. It was a hot day and I marched quickly through the crowded streets with all my luggage on my back. I think I'd expected the main street to lead straight to the tower, so that it would appear first from a distance, but instead you take a slight side turn so that when you first see it you are close and it rises above you – leaning just like the pictures.

In fact it was smaller than I had thought (most things are), and the clear picture postcard view was obscured by cables supporting it from above, huge concrete blocks weighing it down below, and scaffolding around. But still wondrous, nevertheless. And not just for itself and its oblique, albeit obscured, grandeur, but because of what it represented. It was like meeting Batman, or James Bond, like a trip to Never-Never Land, a place you had read about in stories, seen pictures of, a part of childhood imagination, but it was now tangibly real.

Now that was an experience, a first-order experience. I was there, I saw it and I felt it. While it captured my imagination and recruited my imagination, in itself it did not require my imagination, neither the Tower nor my being there. It happened to me there and then.

Now over the years I have told people about this, probably first my family when I went home. Talking to my children, who were still young, I used different language from what I used above. Partly because the situation was different and I used pictures as well as words, but partly because they are different from you, reader, they had not seen so many of the stock images of the tower, they had not heard of Galileo dropping cannon balls to test theories of gravity, they did not share all my own understandings or your understandings and so I told them a different story.

Telling stories face-to-face is second-order experience. You are there, with the person. You need to understand who they are, what they know, what they will understand, what you have told them already, what they might want to know. You need to recruit all the power of your human social understanding, to watch their eyes for interest or boredom, feeling body language and to some extent seeing inside their own mind. You are thoroughly there at the moment of telling – you and the listener – that is your first-order experience. But at the same time you need to hold in your mind the thing that you wish to tell about. Whether it is a real incident like Pisa, or embellished, or completely made up, the subject of the conversation is purely in your mind, called into your imagination – second-order experience. Simultaneously, you need to deal with the imagined experience of your narrative and also the actual experience of your listener.

And what of when you write? I started to type "Some years ago I visited Pisa for the first time ..." just a few minutes ago ... or was it weeks or months – when are you reading this, reader? I mention you because I have to think about you. Do you know about the Tower, about Batman? What language would capture your imagination? Writing is a sort of imagining of telling. I am here, in my back room, the early morning sunshine on the garden. This is my first-order experience.

But to tell you the story I have to imagine you reading these words, or more commonly almost imagine myself telling you these words. As I do the writing I imagine the telling, imagine you, recruit in that imagined picture of you – all the same social understanding I need in face-to-face telling, but without you here to constantly remind me of who you are and what you know and care about.

And yet at the same time, just as in my face-to-face telling, I need to hold that picture of the Tower itself, my feelings, the heat of the day, the small stall where I bought the can of drink ... maybe conflating several visits (were the cables there on my first visit or just the scaffolding?), but, whether real or imagined, calling that experience into my mind as I also imagine the telling of it. The visit itself is third order – the imagination in my imagined conversation – and I have to hold all three experiences in my mind at once: my hands staccato playing over the computer keys, you my reader, and Pisa in its glory. No wonder writing is hard.

But when we understand we can start to make it easier. One problem is that blank sheet of paper, or, I guess, blank screen: how to get started. You know in your head what you have to say, but not how to say it. But strangely, if a friend walked in you would probably just tell them all about it. Narrative and story telling go back through human history and are perhaps one of the key things that turn us from mere human bodies and brains to human beings. So this second-order experience, itself quite an amazing ability, is one that is intimately part of our common humanity. Some tell stories better than others, some stories are easier told than others, but we all, to a greater or lesser extent, can do this.

We can use our facility with second-order experience story telling to help our third-order experience writing. Have you ever noticed that the same topic you could not write about, if asked as a question by email becomes easy to write down? I know I have written long emails on things that I had long failed to get started in writing 'properly'. The email to a friend is not so different from telling your friend; you know them so well, you can imagine their reactions – and have often shared many experiences with them: so you have to do less explaining, say things more briefly, and in the end, just as in conversation, they can mail you back and ask if things are unclear.

So I have often suggested that students who are struggling to get started simply write me a email about a topic, or write in a word processor, but to me personally. By simplifying the second order of the imagined reader, doing the third-order activity of writing becomes easier.

In fact the hardest part of writing is the second-order imagined reader and this tell-it-to-a-friend technique is focused exactly on that.



Very often I've found my best academic papers come after I have had to give a talk on the topic. Even though I have still had to produce slides before the talk, somehow imagining actually saying the words is easier than imagining someone reading them. And of course the slides are not the whole words, just prompts or overviews. Because this third-order experience is in some way easier than writing, I make a better job of creating a structure that is understandable and engaging. Not that the eventual written words are the same as the words used in the talk, but the structure I produce is often far better than when I start to write from scratch. When I do come to write, it is like retelling an old story rather than telling it for the first time.

Even when there was no talk to give I have sometimes suggested to colleagues that they write a set of slides as if they were going to give a talk on a topic and then use those as their outline for a paper. Again this technique helps you to bring that elusive reader to mind and so understand what will sound best and read best.

Often what you write seems perfectly good to you, and maybe even to your close colleagues, but when someone new first reads it they have no idea what you are on about. Often you completely forget that concepts or ideas that are second nature to you need explaining to others. The single phrase that seems self-explanatory needs a whole paragraph or even paper to explain (as if I had just written 'third-order experience' in the middle of something else). This is a problem in picturing the experience or knowledge of your imagined reader. Sometimes this is because the concept is a new one that you are introducing in the paper and will explain later. The problem is that you expect your readers to understand something before you have told them about it!

Once you understand the problem you can do something about it. You may simply omit the reference to the as yet unexplained concept, or may add a short explanation sufficient for the time. Alternatively you might give the reader a clue that they are not expected to understand. At the beginning of this article I wrote "let's look at just one reason: third-order experience" – I did not explain third-order experience as a concept, but I think (I hope!) that the way it was phrased, the fact that it was also the title of the article, would mean you understood that this was to come, the thing you were about to learn – one of Rumsfeld's known unknowns³.

Of course here is exactly where the tell-it-to-a-friend approach does not help – in fact the reason for the problem is that you are writing as if for yourself or a close colleague. Writing for a friend is often a good way to start, to fill that empty screen, but not how to end the writing process.

But that vague faceless unknown readership is hard to write to, talking to a tailor's dummy, just like designing for a user profile rather than a person. So make it personal. Perhaps imagine a persona: a typical person who might be reading your words, an imagined person, but a particular singular person, one you can really imagine speaking to – recruit your latent social intelligence waiting to help you and guide you. Or perhaps a 'real' real person: try writing for that colleague across the hall, who knows your broad area, but not the particulars. The first person I ever worked for used to tell me he always wrote so that his mother would understand ... didn't I start with letters to your mum?

And you, dear reader ... who do I imagine you are? Strangely I've not pictured you as a person; you are vague, but not entirely faceless. I think I have given sufficient lectures and

talks that I have got used to talking to a group and understanding them as a group – and we do this frequently: groups of friends, family, it is natural. Talking to groups of unknown people, though, is different, and common advice for speakers is to focus on a single member of the audience and speak as if for them alone (although that can be embarrassing if you are the chosen person!). Just like writing for a specific persona or person, by talking to one person our natural communication abilities surface. I know I still notice specific groups of faces as I give talks, and in particular those who smile and react to my words, gauging the level and pace of my presentation by the light in their eyes.

So you, reader, are more like a lecture hall, full of half-glimpsed faces. And have I managed this third-order experience successfully? Now, when I write 'third-order experience', does it mean more to you? Are you the sleepy professor at the back of the hall, or is it your eyes and smile that I have noticed in the crowd?

Notes

For web links to related material see

<http://www.hcibook.com/alan/papers/writing-third-order-2006/>

1. Elizabeth Barrett Browning. How do I love thee? Let me count the ways. *Sonnets from the Portuguese*.

<http://www.infoplease.com/t/lit/sonnets-portuguese/43.html>

2. There is extensive writing about writing. For an academic perspective, especially about the process of writing, see Mike Sharpley *How We Write*, Routledge, 1999; or for first hand accounts by poets and novelists see Brewster Ghiselin (ed.), *The Creative Process*, University of California Press, 1952.

3. See BBC News, "Rum remark wins Rumsfeld an award", 2nd Dec. 2003. <http://news.bbc.co.uk/2/hi/americas/3254852.stm>

... as we know, there are known knowns; there are things we know we know. We also know there are known unknowns; that is to say we know there are some things we do not know. But there are also unknown unknowns – the ones we don't know we don't know ...

I find myself with little good to say of Donald Rumsfeld, but this often ridiculed phrase, is in fact sharply perceptive, and worth reading carefully and remembering. In many areas it is the unknown unknowns that are most difficult but most important. Strangely, ethnographers study the category that Rumsfeld omitted: the unknown knowns, the ones we don't know that we know (sic), the tacit understanding that makes ordinary life flow. To some extent this article is exactly about this unmentioned category, encouraging you to explicitly know more about your tacit understanding of people and communication.



Alan Dix is Professor of Computing at Lancaster University. As well as co-writing a well-known textbook in HCI, he is interested and has worked in most areas of HCI, many areas of computing ... and anything else he has noticed along the way. His first love is mathematics, but nowadays he's more likely to be found considering the design of ubiquitous technology and situated displays, pondering the cognition

of creativity, discussing the relationship between arts and technology or hacking the odd intelligent internet tool.

Alan Dix

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My PhD

Evaluating affective virtual humans over extended interactions

Chris Creed

edited by Martha Hause

After completing my undergraduate degree in 2003, I felt a severe lack of inspiration from many of the job opportunities available to Computer Science graduates. I wanted to be enthusiastic, passionate and excited by my work, not just go through the motions every day. I have always had a strong interest in the social sciences and why people do what they do, so undertaking a PhD in HCI presented a great opportunity to study both computers and people together. I am just over half-way through my second year as a PhD student at the University of Birmingham and have spent much of that time reading, thinking and writing about the main literature related to my topic of interest, and building my experimental system.

My primary area of interest is on how we respond to synthetic displays of emotion in interface agents. By 'interface agents', I mean anything in an interface (text, speech, or graphically based) that attempts to interact intelligently with us in some way. Interface designers often incorporate emotional expressions and statements into their interfaces through the use of textual content, speech, synthetic facial expressions, and video, but little is known of how we respond psychologically to these expressions of emotion and what effect they have on a user's perceptions, behaviour and performance. Are our responses to a synthetic smile similar to that of a human smile? How do we respond to synthetic displays of joy, happiness, sadness, frustration and disappointment? Can we catch emotions from computers?

A number of recent studies have suggested that we do indeed treat synthetic emotional expressions as genuine human emotional expressions and that we generally like and trust emotionally expressive agents more than unemotional ones. But how strong are responses such as these? Can this increased positive perception of emotional agents be utilised for any beneficial purposes? One way to consider this is to look at human social relationships. We are more likely to act on the advice of people we like and trust than people we dislike and distrust. Does the same principle apply in HCI? That is, if we generally perceive emotional agents to be more likeable, trustworthy, supportive and caring, can they influence our attitudes and behaviour more effectively than unemotional agents?

To investigate this further, I have built a virtual human which will simulate the role of a human health professional and will advise people about how they can incorporate a healthy diet into their everyday lives. The agent makes use of many of the skills and strategies that human health professionals often use when attempting to help motivate people to improve their diets. I will soon be running an experiment to compare and investigate people's responses to an emotional and unemotional version of the coach. The two different agents will differ primarily through their voices and facial expressions. For example, the voice of the emotional agent will vary widely in pitch, tempo and loudness, while the unemotional agent's voice will vary little in these. Also, the facial expressions of the emotional coach will simulate emotions such as happiness, warmth and concern (empathy), while the unemotional coach's face will remain more neutral.



The experiment will be web based and subjects will be asked to have a 15–20 minute 'session' with the agent. They will be able to interact with the agent through a set of pre-scripted responses that will be provided and, once the session is complete, subjects will

be able to view educational material about having a healthy lifestyle for as long as they desire. Following this, they will be asked to complete a questionnaire that will be used to measure their perceptions of the agent. Through conducting this experiment, I am interested to see (1) whether people generally perceive the emotional agent more positively than the unemotional agent, and (2) whether the emotional agent can enhance people's motivation to improve their diets more effectively than the unemotional agent.

After the completion of this study, I would like to conduct a similar experiment again, but over an extended period of time. The main motivation for this is that the majority of studies related to what I am doing are often completed over a single session, typically lasting less than an hour. However, as we start to work more closely with agents that carry out everyday tasks on our behalf, we are likely to develop long-term relationships with them and will grow to know and trust them. This makes it essential that future studies concentrate in detail on how we respond to emotionally expressive interface agents over both short and extended periods of interaction.

I am looking to conduct experiments around November and December of this year, so if you are interested in participating or would like further information about what I am doing, please get in touch.

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Experiencing design

Learning to skate

Robert St Amant

Textbooks and popular treatments of HCI usually touch on learnability. The learnability of a system includes two important parts: how easily new users can learn to carry out common tasks and, once a task has been learned, how easily users can improve their performance.

There are obvious differences between software environments and the real world, and these show up in learning. For example, last year during an extended stay in California I learned how to skate with inline skates. (I can now manage to stay upright most of the time, though I'm far from being good.) My first step was putting on the equipment. Lacing up the skates was surprisingly complicated, because the eyelets are in an unusual pattern. It took some experimentation to figure it out: "Is this right? No, the ends aren't long enough to reach these holes..." In contrast, the latches that help hold my ankles in place were straightforward. By working the latches back and forth, it's easy to see how they fasten, even if they are unfamiliar at first. My wrist guards were another story. These are open-fingered gloves holding a piece of curved metal to protect my hands if I fall. I first put them on the wrong way, so that my wrists were bent slightly forward, not realising that force on my palm would have bad consequences for the rest of my hand. Because it was difficult to move my wrists around naturally with the gloves on backwards, I was able to notice and correct my mistake. My students offer similar examples, though sometimes with less clear resolution:

I have a bucket in my dorm room to hold laundry supplies. The lid looks like any other lid, except that to take it off, you first have to fold the edge outward and upward to unlock it. There are instructions on the lid, but they're so small you can't really see them. If someone is ever with me when I need to get something from the bucket, I ask them if they'll open it for me. Hardly anyone figures it out. When they give up, I show them how it works.

Several HCI concepts can play into an explanation of equipment use: affordances, constraints, and forgiveness, to name a few. What about the learning process, beyond the starting point? In learning to skate, I watched other (much younger) people skating around me and tried to match their general movements. Once in a while I asked someone's advice. I practised simple techniques until they became second nature, and I found that simple actions sometimes led directly to more complicated ones.

Contrast my experience to learning a new software application. I'm usually alone in my office. Sometimes I can ask my colleagues questions, though I rarely do. Like most people, I hate to read instruction manuals. A final difference is that practice, by itself, is much less effective for learning in software environments than it is in the real world. That is, while I can learn to recognise icons and find menu items more quickly, my increased familiarity with some sequence of actions doesn't usually open me up to new possibilities unless I deliberately start experimenting.

When my students recount examples of poor design in the real world, these rarely have to do with physical, continuous learning experiences like skating. More often, the examples

describe cases where step-by-step prescriptions go wrong, especially when technology is integrated awkwardly into a task.

At my job in a department store, you first pay for large items at the register and then you pick them up in a delivery area. In the delivery area, there's a machine that scans your receipt, asks you a few questions ("Is this your order?"), and then sends a message to the warehouse for the right items to be brought out. It's dead easy. Customers find it annoying, though, mainly because they don't take the time to read the instructions about what they need to do.

The difference between learning to skate and learning to use an unfamiliar computer system can be described in terms of what Lucy Suchman has called 'situated action'. The basic idea is that if we try to understand a task in some abstract form (in the extreme, someone might ask, "How much – or rather, how little – would a robot need to know to execute this task?"). We can easily lose sight of context that makes the task hard or easy for people to carry out. Our activities are usually situated in some context: the context of a specific physical situation or locale, a more general work context, a social context, a play context, and so forth. Context influences our actions, sometimes much more than decision making in the abstract might.

How can these ideas influence interface design? No detailed design guidelines have come out of this work, but the message that designers should be sensitive to context is clear. Consider the receipt-scanning example: After having paid for some item (a social interaction with the cashier), a customer arrives at a warehouse entryway with an unfamiliar computer standing in the corner. I'm always a bit nervous about using "someone else's" computer, even if it's a public kiosk, and I doubt I'm alone in this. We might improve the interaction by thinking about how people learn new activities, even an activity like skating. We might imagine customers watching a looped video or a sequence of signs with pictures that demonstrates the process (just as I watched other skaters). Customers might use a telephone handset or microphone, connected to a simple voice recognition system, to ask questions about the process (just as I asked advice of others). If other customers were going through the same process, they could watch each other. None of these solutions can completely replace a human to handle problems, just as having a human trainer is usually best for learning, but their concessions to context should help.



Robert St Amant is an associate professor in the computer science department at North Carolina State University. 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.

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Interfaces Reviews

edited by John Knight

In this edition we have three books that all deal with interaction. Ria Sheppard looks at a practical design book on the subject while Paul Bellamy looks at the challenge made to seamless interaction by Bolter and Gromala. Finally, I review the recently updated *Hertzian Tales* by Anthony Dunne.

Exploring Interface Design
Marc Silver
Thompson Delmar Learning, 2005
Paperback, 352 pp.
Illustrated: Monochrome
List price £26.50
ISBN 1-4018-3739-5

Most people know the pain of wading through a dry technical textbook in an effort to get to grips with a new subject area. That's why it's such a joy and surprise to come across a different beast entirely; *Exploring Interface Design* by Marc Silver is easy to read, conversational yet authoritative, and packed with illustrated examples of good and bad interface design elements to support a reader as they learn about the world of interface design. Intended primarily for web design students, in an effort to coax them away from their preferred paint program or developer tool as the first step in the design process, Silver has written a very sparky introduction to interface design and how best to approach it.

Exploring Interface Design starts by introducing the reader to the power of the web and multimedia, as well as the cost of getting things wrong. Silver starts off as he means to go on with examples of bad user experiences that are easy to understand and relate to the web ("imagine having to reintroduce yourself every time you saw your best friends"). Strong, thought-provoking examples of dos and don'ts crop up in support of many of Silver's guidelines and recommendations, allowing the reader to see the context of what they are reading and understand it better. The book is structured around a typical user interface design process.

Silver introduces the interface design process in its most common forms, then follows the basic process himself, starting (chapter by chapter) with goal setting and task and audience analysis, idea generation, and onwards to the more knotty problem of how to actually arrive at the design for a new interface. Here he covers menus and navigation, visual layout, writing for

readability, and accessibility in design. As well as giving readers a grounding in the many, often conflicting, design principles and considerations, Silver works through three design examples of increasing complexity, exploring the points made throughout the book in a way that allows the reader to think about how conflicts might be explored and resolved in real projects.

The book strikes a nice balance between the creativity needed to design a great interface and the practicalities of designing something to cater for end users, while also having to manage clients and stakeholders. The chapter on creativity and ideas generation gives some guidance on how a designer might get their creative juices flowing, while the next chapter on menus and controls provides hard and fast rules on when to use a control and when not to. For the budding interface designer there is also a chapter on professional practice, including tips on managing clients and difficult situations. Although this book will probably be too simplistic for experienced interface designers, for those who dabble as part of their larger work in usability it is a fantastic reference, destined to be well thumbed, dog-eared and close to hand.

Reviewed by

Ria Sheppard

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Windows and Mirrors: Interaction Design, Digital Art, and the Myth of Transparency
Jay David Bolter and Diane Gromala
MIT Press, 2003
Paperback, 538 pp.
Illustrated: Monochrome.
List Price: £20.95
ISBN 0-262-02545-0

Windows and Mirrors is a collection of essays by Jay Bolter and Diane Gromala that argues against the (usability experts and technological 'structuralists') notion that developing technology will not and should not become invisible. Rather, they say that we, the audience/users, should be aware of our experi-

ence with technology and that the goal of digital design should be to establish a rhythm between transparency (where we are unaware of the medium that we are interacting with) and reflection, where the medium itself helps us to understand our relationship with it. And so here is the core concept behind the book: how can and should interaction modulate between transparency and reflection.

The bulk of the examples in the book are from digital art and there is a collection of essays about specific pieces from the SIGGRAPH 2000 Art Show. These essays discuss, among other things, how works in the exhibition embody reflection and transparency. Rather annoyingly, at no point in the book do the authors unravel the SIGGRAPH acronym; it remains SIGGRAPH throughout. They then launch into a fascinating 'brief history' of the computer as a medium. This section of the book is well written and paced, informative and easy to digest. It begins with Alan Turing at Manchester University in 1949 and ends in the 1990s with the emergence of the Internet as we know it and the height of virtual reality fever. They make some amusing observations along the way:

It's amazing how seductive the rhetoric of prediction is. As recently as 2000, in 'Designing Web Usability', Jakob Nielsen was predicting that computers would replace printed books by 2007.

There is an interlude to discuss one of the pieces at SIGGRAPH 2000 before the authors go on to explain the emergence of the computer interface. This section takes in everything from early punch cards to contemporary operating systems. Again, this history is extremely interesting and lends valuable context to the technology that we use every day. This moves on to a discussion on convergence, where in most technologists' minds we end up with a huge high-definition screen that all our media devices interface with. Or maybe a mobile that doubles as a microwave! Bolter and Gromala argue



that while 'Digital Technology may not have converged yet the predictions of the enthusiasts have'.

In the main (apart from a repeatedly bothersome slight against William Gibson's *Neuromancer*), the arguments offered for their vision of where technology is headed are convincing. The authors write eloquently and persuasively about their consensus vision of the future, of 'embodied virtuality'.

Where this book falls down is in the discussion of the digital art. The book was written in 2003, about a digital Art Show that took place in 2000. In terms of technology, that's a very long time ago. Context becomes the major issue, as with most art forms. The problem here is that the artworks being written about are doubly out of context – not only are we reading about them rather than experiencing them as intended, but they are also historically contextual – the things that digital artists were doing in 2000 seem almost commonplace six years later due to the nature of the fast moving development of technology and its increasing pervasiveness into our everyday lives.

The authors write passionately about 'Text Rain', in which the viewer sees themselves projected onto a screen while letters fall from the top of the screen around them. They can interact with the letters by catching them; in their hand or on their extended arm, for example. But the reader is inevitably and repeatedly left with the hackneyed question: "Yes, but is it art?" Bolter and Gromala argue strongly that it is, but their prose is often uncomfortably pretentious, or even desperate:

Text Rain becomes a kind of kinetic poem... Often, the letters that rain down offer only nonsense, but sometimes they make just enough sense to encourage the viewers to find meaning. 'Tuning Gear und too' or 'ymfor limbs'... could be phrases from James Joyce.

Indeed.

Repeatedly the problem comes back to that of context – if I move your work from this gallery, with its typical audience, into a different situation, it will be interpreted in an utterly different way. It may be interacted with in the same way (most of the pieces written about are fairly limited in the freedom that they offer the audience), but the appreciation and interpretation of the work would not be the same. It's almost as though the authors, without explicitly writing it, are admitting that

it is the situation of the gallery that forces the cultural and media theorists to really consider and contextualise what is being put in front of them. They may experience the same technology or interactivity at other points in their day, but it is the art gallery that encourages pontification beyond acknowledgement of the experience. What is disappointing is that often the exhibits in the gallery are less interesting or worthy of a deeper consideration than some more 'everyday' experiences, but their situation grants them a deeper meaning.

Reviewed by

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Hertzian Tales: Electronic Products, Aesthetic Experience, and Critical Design
Anthony Dunne
MIT Press, 2006
Hardback, 200 pp.
Illustrated: Monochrome.
List Price: £19.95
ISBN 0-26204-232-0

I have read *Hertzian Tales* a few times since its first publication in 1999. I have read it mainly because it has been recommended by people I respect and who often refer to it. In addition, in my area of design it is pretty difficult to ignore Dunne. For those of you who are unaware of Anthony Dunne, he is Professor of Interaction Design at the Royal College of Art in London. He has published another book on *Design Noir* and also works in a design partnership with Fiona Raby. Before coming to the Royal College both lived in Japan. Dunne worked for Sony and Raby for a 'cross-disciplinary architectural practice'.

Seven years ago, Dunne's ideas were pretty radical. They challenged design orthodoxy and some of the basic tenets of HCI from a politicised design perspective. Back then, challenging cognition in HCI and semantics in design was in the van. Now, however, these issues have cooled and attacking them now seems rather trivial, especially in the context of the political and economic changes that have occurred. Lastly, more cogent, deeply researched and popular critiques of cognition and commercial design have been published.

In the new foreword to *Hertzian Tales* Dunne admits as much. In particular he notes that technology has moved on apace. He still, however, maintains that 'Electronic technologies are still

dealt with on a purely aesthetic level ... [and] design is not engaging with the social, cultural and ethical implications of the technologies it makes so sexy and consumable' (p xi). Perversely, his examples of 'exceptions' to that rule include Swarovski and Apple.

Dunne states that 'The primary purpose of this book is to set the scene for relocating the electronic product beyond a culture of relentless innovation for its own sake, based simply on what is technologically possible and semiologically consumable...' (p xv).

In this context the most difficult challenges for designers of electronic objects:

Now lie not in technical and semiotic functionality, where optimal levels of performance are already attainable, but in the realms of metaphysics, poetry and aesthetics, where little research has been carried out... (p 20)

While this perspective is useful (as demonstrated in the prototypes he created) for critiquing electronics, it is unclear how this could be generalised and how appropriate it is to different people.

The first chapter is called 'The Electronic as Post Optimal Object' and focuses on designing stuff when 'practicality and functionality can be taken for granted' (p xvii). Essentially this argument is that if everything works as well as it will ever do then maybe it is time to move onto deeper design problems. The question for me, is do we really live in a post optimal world and is aesthetics the most crucial goal for design? Indeed, should it be the goal of design?

This section moves on to look at different approaches to understanding the electronic product. The author notes that 'the most fruitful reflection is to be found, not in anthropology or sociology but in literature concerned with the poetics of everyday.' Again the age of the book has weakened this conclusion. In particular the contributions of Molotch and Petrovsky are absent from the analysis. It is also unclear why the favoured approach is the most successful other than it being the most individualistic and aesthetic and thus usable in the post optimal project.

If usability characterises the optimal experience then gentle provocation should characterise the post optimal product. Quoting Baudrillard and Virillio with the latter's assertion that 'Interactive user-friendliness ... is just a metaphor for the subtle enslavement of the human being to the "intelligent"

machines [and that] ... Enslavement is not, strictly to the machines ... but to the conceptual models, values and systems of thought the machines embody' (p 21).

Dunne has a serious problem with the human factors, which seems incredibly biased. Especially, in the context of Patrick Jordan and *The New Human Factors*. I will quote the whole paragraph:

Some writers on the social history of technology present the ideological dimension of everyday technologies, even if these are often pre-electronic. This is ... useful to critique the human factors 'community' who have developed a view of the electronic object, derived from computer science and cognitive psychology, that is extremely influential. A serious problem with the human factors approach though, in relation to this project is its uncritical acceptance of what has been called by Bernard Waites the 'American Ideology' or the ideological legitimization of technology. (p 2)

A very selective history of HCI is given that includes Englebert (sic) and Licklider. Dunne notes, however, that these pioneers managed to develop a 'vision of interactivity' (p 23) but were 'unable to introduce them into everyday life. It was hackers like Steve Wozniak and Steve Jobs who eventually managed to translate these ideas [for] ... the marketplace' (ibid).

Dunne also (citing DeLanda) 'Situates the origins of the man-machine interface within a military context' (p 22). Whatever the truth of this 'history' it kind of misses the point. Ergo: Cats Eyes, Preserved Food, etc., and do not mention camouflage. Leaving the polemics aside Dunne does have a point which has nothing to do with history. In the real world of commercial design product quality is often subsumed by commercial imperative. To what extent this can be challenged by moving to a challenging and individualistic design approach I think is questionable.

Ettore Sottsass is given as an example of good design to contrast with the human factors approach and user-friendliness (p 24). However, this example of an office seems to be text book ergonomic design. The key point here is not the outcome of the design or the approach but the primacy of the individual designer. Dunne notes that:

The designer ... no longer knows anything for certain; all he or she can offer are the contents of his or her own head. (p xvii)

The second chapter comes closer to home and is titled '(In)human Factors' and builds on the fear of ergonomics. The author argues that usability in the home is even worse than in the office. Dunne concludes that:

When used in the home to mediate social relations, the conceptual models of efficient communication ... leave little room for nuances and quirks on which communication outside the workplace relies so heavily. (p 42/3)

In order to develop an alternative Dunne looks at how fine art can inform design. Here fine art is edgy and ideologically challenging rather than emotive or expressive. Taking the model of the modernist avant-garde, Dunne argues that design has a pure and evangelical job to do that involves:

Not just visualising a 'better' world but arous[ing] in the public a desire for one ... This kind of design can only exist outside a commercial context and indeed operates as a critique of it ... [however] ... There is a danger that if design is not oriented to the marketplace it is seen as invalid, irrelevant, or self-indulgent, especially if displayed in a gallery. But what if the gallery were viewed as a test-site for designs? (p 83/4)

The rest of the book is less irritating and a good deal more interesting. Para-functionally: *The Aesthetics of Use* looks at how electronic products offer new types of aesthetic experience. There are some good examples from antique oddities and from the world of quirky products. These include the work of Phillip Garner who famously designed a two-person hat!

Psychosocial Narratives is about how behaviour is a narrative experience which is in turn influenced by objects. Examples are given of scanners and a phone that detects whether the caller is lying. The focus is squarely on the product, however, rather than what we would call interaction. Furthermore the involvement of users is marginalised. For all its grandiose polemic against the passive consumer the sole example of '(ab)user' involvement is that office favourite: people taking photocopies of their parts. *Real Fiction* begins to introduce Dunne's design work and is about how objects embody ideas. *Hertzian Space*, meanwhile, offers an interesting insight into the hidden world electromagnetic spectrum. All of these ideas about aesthetic objects, challenging the viewer and making the invisible visible, come together in the final part of the book.

'*Hertzian Tales and Sublime Gadgets*' gathers Dunne's design work. These include 'Electroclimates', a pillow, designed by the author, that reacts to changes in the radio frequency environment. 'When Objects Dream' makes low-level electromagnetic radiation 'visible' in the same way that 'Thief of Affections' does for signals from pacemakers. 'Tuneable Cities' is a car radio tuned to unusual signals such as baby monitors. Finally, 'Public Utility' updates the traditional Faraday chair in order to protect people against rays.

From reading this review you might think I would not recommend *Hertzian Tales*. And the past seven years since its first publication have not been kind to it. The Internet, mobile telephony and games have emerged and changed the landscape that electronic products inhabit. Furthermore, user-generated news, blogs, and SMS are all examples of people fashioning technology for their own means and in ways that are truly participatory and interactive. Despite these shortcomings, the book raises a crucial and relevant question which comes down to: what is good design and what good can designers do?

Reviewed by

John Knight

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Next issue's Reviews

Wired for Sound by Clifford Nass & Scott Brave, MIT Press

reviewed by Kevin White

Mobile Interaction Design by Matt Jones, John Wiley

reviewed by Sandra Cairncross

User Interfaces for Virtual Reality

Applications by Chris Esposito & Lisbeth Duncan-Lacoste, Morgan Kaufmann
reviewed by Ken Iino

Voice User Interface Design by Michael H. Cohen, James P. Giangola & Jennifer Balogh

reviewed by Alexandra Weilenmann

John Knight is a User-Experience Manager in the mobile communications industry. Before this he was Director of User-Lab at Birmingham Institute of Art and Design and has worked as a freelance designer and researcher. John is also chair of the Design for Engagement Conference series which is at NordiCHI this year.



Pete Wright talks to Alan Dix



Until September 30th 2006 I am a Reader in HCI at the Department of Computer Science, University of York. After that, I will be Research Professor of Human-Centred Design in the Cultural, Communication and Computing Research Centre at Sheffield Hallam University. I have been at York a long time, first in Psychology and then Computer Science. But I did my PhD in

Edinburgh's School of Epistemics (now the Cognitive Science Department) and, after that, worked in Language and Linguistics at Essex. After that, my wife and I took a year in South East Asia, fulfilling a lifetime's ambition to climb in the Himalayas and generally bum around before settling in York.

What is your idea of happiness?

The mountains, a blue sky, and flat-calm, clear sea

What is your greatest fear?

Immobility, in the sense of not being able to walk

With which historical figure do you most identify?

Baldrick

Which living person do you most admire?

Captain Jack Sparrow

What is the trait you most deplore in yourself?

Always seeing a half empty glass

What is the trait you most deplore in others?

Always seeing a half full glass

What vehicles do you own?

A battered white 'M' Reg Peugeot 106 that I bought for £600 and a bike I haven't used properly since 1995 – I must get back into biking

What is your greatest extravagance?

Holidays we can't afford

What makes you feel most depressed?

Reading the newspaper

What objects do you always carry with you?

Nothing valuable, my pockets always seem to have holes in them. Bertrand Russell said a pocketful of philosophical paradoxes was always a good thing to have – but I'm not convinced.

What do you most dislike about your appearance?

Generally I'm quite pleased with my body but I wouldn't say no to a dental makeover – I might smile more often and better

What is your most unappealing habit?

Clock watching

What is your favourite smell?

There are so many – smells take me all over the world – Wood smoke takes me to Nepal, but perhaps one of my favourite smells is the smell you get when you get off an aeroplane on a hot summer's evening in a Mediterranean country. Oh, and Bacon cooking in a campsite of course.

What is your favourite word?

Maybe

What is your favourite building?

A Buddhist Temple in Bangkok I can't remember the name of but I have a picture of it in my Bathroom

What is your favourite journey?

Driving the back roads from Siena to Montalcino in late May

What or who is the greatest love of your life?

My wife Janet, whom I have known since I was 16 and married when I was 22. And our kids of course.

Which living person do you most despise?

I don't think I despise anyone but some people get up my nose a bit, especially grown ups

On what occasions do you lie?

Always

Which words or phrases do you over-use?

Absolutely

What is your greatest regret?

That time does not pass more slowly for me

When and where were you happiest?

In 1987 soloing an ice field at 20,000 ft above the Tibetan Plateau. However, this is on reflection – at the time I wasn't a happy bunny. Adventures are hardships and sufferings had in the retelling.

How do you relax?

Apart from the obvious – I go running in the hills

What single thing would improve the quality of your life?

More time

Which talent would you most like to have?

Conversation – I'm not very good at it

What would your motto be?

Must try harder

What keeps you awake at night?

Exam setting

How would you like to die?

I've always thought 'by misadventure' would be interesting

How would you like to be remembered?

Here lies the body of Pete Wright, climber, mountaineer, diver and family man (he also wrote a couple of good books)

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