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Playing to learn

Jon Pearce on exploration and learning

Ioanna Iacovides on the role of involvement in learning

Janet C Read's volcano inspired research

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Authors should please provide a 70–80-word biography and a high resolution head and shoulders original digital photo. Photographers' credits will be printed if provided.

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After being one of those estimated half million Brits stranded and waiting for the dust to settle, it's interesting to reflect on the positive and negative sides of technology interaction during this time. Friends showing off their new iPhones must have had horrendous roaming and phone charges waiting for them after a week. But I still got caught out in my desperation to get home when I bought a Eurostar single ticket from Amsterdam to Edinburgh and nowhere during the interaction was I informed that I could only pick up the ticket in Brussels or London – yes Tom, *caveat emptor*.

On the positive side, free WiFi allowed me to stay in communication without facing bankruptcy. Facebook allowed me to see who was stuck with me and be part of a community of the stranded. Skyscanner.com allowed me to book a hotel for my arrival moments before finally boarding a flight to escape from New York, knowing it would only take me as far as Amsterdam.

I am now relieved to have my first issue published and I would like to thank John for the articles he left behind. The proverbial cupboard is now well and truly bare. Which brings me to Janet's article on volcano inspired research and her reflections on community, and I would urge you all to share your thoughts and ideas with this community, invite others to contribute, be it PhDs writing for the first time or those who would not traditionally publish in HCI or a magazine.

Ironically I am now planning for NordiCHI in Iceland – see you all there??

Lynne Coventry

Contents

View from the Chair

Tom McEwan
T.McEwan@napier.ac.uk

Hi folks. No matter how cautious we may try to be, there are still too many things in life that can't be predicted or prevented or protected against. Apologies to those of you who have had a surfeit of my tweets and Facebook postings on the subject, but this reflective practitioner keeps trying to learn lessons from my ten-day limbo, courtesy of Continental Airlines. Only one day of this was affected by the Ash Cloud. The rest was cascade, so there are lessons to learn.

At the heart of my miserable user experience seem to be two things that are worth thinking about for HCI – that *caveat emptor* ("let the buyer beware") is the enemy of human-centred design and essentially socially unjust, and that customer-centredness, at least as practised by some companies, is the antithesis of utilitarianism.

My beef with *caveat emptor* has been growing for almost two decades, directly as a result of working with bleeding edge technology. Basically no-one will tell you – in the adverts, the packaging, the manual or the support website, what it won't do, and they will stretch as thin as possible the contained features and claims, bolstered by eye-grabbing semiotics. As a result I have a growing number of pet-hate brands, whose products, claims and values I simply do not trust. Adherents of any of these suppliers will suggest my experiences were not typical. But it's not hard to find a thousand other tales of woe on the web, though the same can be said for the brands that I do trust!

But every time I try to ask advice from the vendor, to read the small print, to model my own scenarios (I try to keep to a single persona for myself but that's getting harder these days as geriatric grumpiness strikes early), to study the prevailing standards, to insure against low-medium risk, medium-high impact adversities, I miss something. And, under *caveat emptor*, it's my fault (barring a few consumer-protection fig-leaves that tend to blow away anyway in a global transaction). So if that's me – with all my education and life experiences, how much harder it is for those with fewer advantages in life. "Life's not fair" indeed.

Estimates vary, but consensus seems to be that 100,000 travellers between the UK and North America were affected. Non-EU carriers are not required to provide any help with accommodation or meals. Hey, they did offer half my money back for the cancelled return flight, and to sell me a club-class seat for a sooner flight for ten times as much!

A utilitarian approach might prioritise return of the stranded over new travellers, i.e. postpone rather than cancel the affected flights. More would have been inconvenienced, but many non-urgent short stay flights would have been deferred, speeding the clearing of the backlog. In the customer-centred world of these airlines, however, writing off a few thousand as ex-customers is preferable to impairing the service to a greater number. Business income varies little either way.

Anyway! We have a very busy conference this year at Abertay in September – many more submissions, many more of which were positively rated by reviewers. Although we have accepted (slightly) numerically more this year, I regret we have had to disappoint many more authors, despite the positive reviews for their work. If you were not accepted or did not have time to submit, we still hope you'll join us in sunny Dundee. We are trying to design the flow of the week around a deep understanding of your needs, so we don't have to fall back on *caveat emptor*, and, thanks to some utilitarian economising, we've been able to reduce delegate fees by 10% this year.

Tom McEwan
BCS Interaction SG Chair
Edinburgh Napier University

No-one will tell you – in the adverts, the packaging, the manual or the support website, what it won't do, and they will stretch as thin as possible the contained features and claims, bolstered by eye-grabbing semiotics

Play, explore, engage!

Jon M Pearce

Have you ever been searching online for something and realised that whilst you know what you want – or will when you see it – you don't know the search terms to use to find it? Maybe you are trying to find a restaurant with fairly spicy food, a very relaxed atmosphere and a modern décor – but how do you search for that? How can you easily browse several offerings? It is situations like these that motivate the research described here. Situations that lead to exploration rather than searching, yet need some starting point to initiate that exploration.

We describe a highly customisable research system that we are using to explore this issue. Our interest is in placing the user as a critical component of the system and to encourage exploration through the use of affective interactions and user feedback. The environment is a customisable, playful online system that attracts people to a task, maintains their interest in that task, and encourages them to engage with it in a persistent exploratory manner. The examples referred to in the text can be found at http://disweb.dis.unimelb.edu. au/staff/jonmp/projects/*iFISH*/.

The challenge we have is this: how do we strike a balance that provides a highly playful environment, that attracts and maintains a user's attention, and at the same time ensure that the user's focus is directed towards the task at hand and not just superficial play? And how do we deliberately design for this?

Two important factors in informing the design of interactive systems are 'engagement' and 'positive affect'. The study described here aimed to design engaging experiences that would leave the user with positive feelings and hence a tendency to persist with the task

and be prepared to return at later times. The balance between engagement with playful screen artefacts and engagement with tasks had to be carefully balanced.

Concepts of flow (Csikszentmihalyi, 1975) and play have been drawn upon to help in the conceptual design of the online system. To create a successful environment we have identified three key factors:

i   a highly playful interface;

ii   presentation of challenges to the user; and

iii   incorporating the user as part of a feedback loop that supports a 'what-if?' style of exploration.

iFISH: A system for exploration

Design goals

Our aim has been to design a system that would enable us to investigate ideas of play, flow and exploration, using tasks that (i) required the user to explore a reasonably large number of objects about which they knew little of the detail, (ii) was fairly open-ended so that there was no 'right answer' that would curtail the exploration, and (iii) could be related to a set of 'personal preferences' that acted like a set of meta-data linking their personal likes and dislikes to the data.

The system described here (*iFISH*) was built in Adobe Flash and uses XML files to provide a highly customisable environment that can be used with various different data sets and configurations. For example, we have explored visitors choosing exhibitions to view

at a museum, students exploring topics of interest that might help a teacher find suitable learning approaches, people wishing to explore the research projects of a university research group, and even a game in which the user's exploration allows the pieces of a scrambled pictorial puzzle to be re-assembled in the correct order (Pearce & Pardo, 2009).

For the discussion here, we will describe one prototype in which students chose elective subjects for their university course. Apart from having a very playful affordance and providing the user with immediate real-time feedback, we wanted the user to be able to drive the system by entering meta-data relating to their own experiences or preferences. This is in contrast to entering specific knowledge ('search terms') about the things they are exploring – in this particular context, students would know very little about the range of subjects that they could choose from, as they form part of compulsory 'breadth' subjects outside their subject discipline area.

Examples of the use of *iFISH* in different contexts can be found on our project page at: disweb.dis.unimelb.edu.au/staff/jonmp/projects/ *iFISH*/

What does *iFISH* do?

A screenshot from this version of *iFISH* is shown in Figure 1. It is a single screen application that presents to the user a set of sliders and check boxes on the right-hand side of the screen, and a set of subjects represented by labels ('fish') that move around on the left. The fish represent the items that the user is exploring and are ranked from top to bottom according to how well they match the combination of slider values. Check boxes below the sliders allow the students to filter the

Play, explore, engage!
Jon M Pearce

Figure 1 A screen-shot of iFISH

fish based on criteria such as teaching mode, semester of offer, and year level. The sliders are labelled at each end with the following meta-data:

- qualitative ⇔ quantitative
- practical ⇔ theoretical
- investigative ⇔ directed
- working alone ⇔ working with others
- oral communications ⇔ written communications
- focus on exams ⇔ focus on assignments.

For this prototype set-up we used a small data set of twenty-eight subjects, each of

which was manually 'tagged' according to their relation to the sliders. This was a straightforward process of approaching the teachers of each subject and asking them to rate their subject on the six pairs of meta-data above. However, our original *iFISH* system attempted to automatically tag the entire set of university subjects (2,300 in all) using a linguistic analysis process on the short text descriptions in the subject handbook – without great success! A fuller description of this process can be found in Pearce (2008).

System outputs

The output of the system was a list of subjects ranked according to how well each subject matched the user's preferences. This is not unlike a 'recommender system', common

in sites such as Amazon.com, Last.fm.com and Pandora.com. However, in this system, rather than narrowing a search down to a few 'hits', our aim was to provide sufficient stimulus for the user to change an input, observe the outcome, reflect on the effect of the change, and then make further changes. This is the mechanism by which focus on task and engagement is maintained. For example, when the user makes a small adjustment to an input slider, the immediate, real-time, animated change presented on the screen might prompt the user to think 'Oh – that was interesting. I wonder what would happen if I moved this slider even a little further in this direction?'.

Figure 2 shows an enlargement of the control panel, including the sliders, their labels and other check-box options.
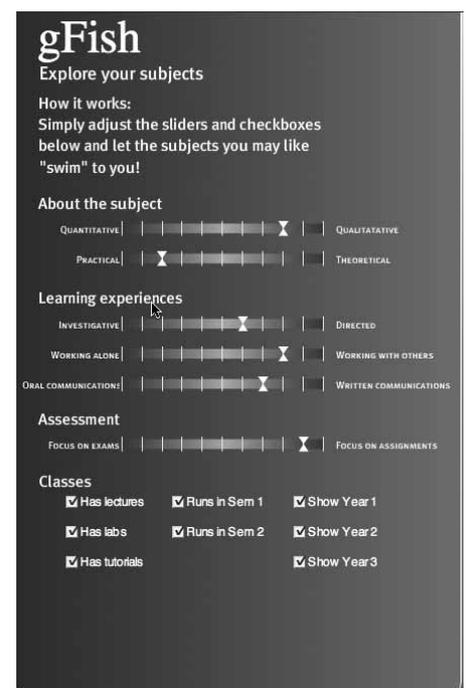

Figure 2 iFISH control panel
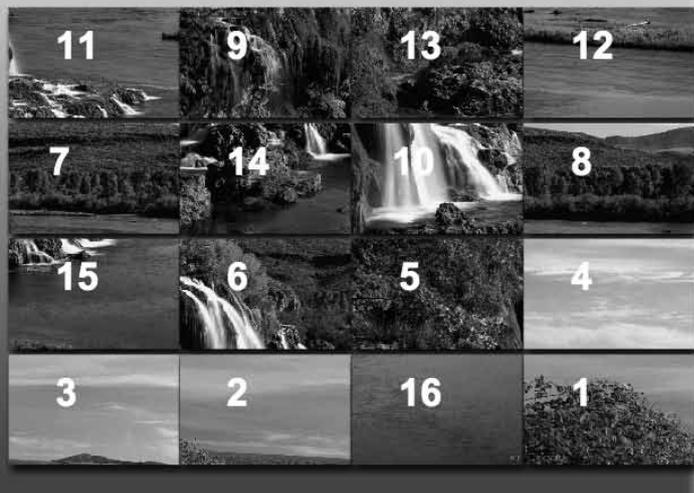
Task 2:
Your goal in this task is to use the sliders to restore the picture.

We have tried to give you some assistance by putting numbers on each tile that show you the order that the tiles need to be in for the image to be complete.
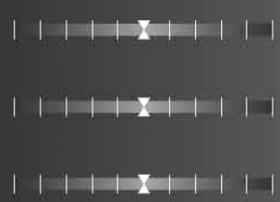
Animated system behaviour

The animated behaviour of the system is important as it provides a stimulus to explore. Any movement of any control in the system causes an immediate animated response from the fish. When the user first launches the program, all the fish 'explode' onto the screen arranging themselves in a ranking that is determined by the default settings of the sliders. As the user moves a slider, the fish 'float' up and down, swapping positions as they re-organise to reflect the new preference settings. This happens smoothly and in real-time – the fish swimming around as the user drags a slider. Very evocative of play! Clicking on a fish's expand icon (top-left of fish) will expand it and display a text description of the subject as presented in the university handbook. An icon at the top right of each fish allows students to contribute their opinion to the weighting of tags as they use the system. This is an idea we are pursuing to see if the system can 'learn' by gathering student feedback. All student activities are logged to a server during operation for later analysis.

The name *iFISH* was derived from *interactive Foraging In the Subject Handbook*. It gave an appropriate flavour of 'fishing around' for results!

Exploring the use of *iFISH*

We investigated the use of the system with a pilot study in which a small group of students gave feedback about several areas of interest. They undertook a comparison task between using *iFISH* and using the university's online handbook to find suitable subjects for a given scenario. We wanted to understand how they *reflected* on the effects of their input choices;

how *playfulness* impacted on their experience; the *breadth* of their exploration of the subject space; to what extent their engagement was *mindful*; and their *satisfaction* with the system. For this investigation we used the 'original' version of *iFISH* that contained 2,300 subjects. This version had many features not present in the version described here. However, due to the inadequate nature of the automated tagging process, there were deficiencies in the behaviour of the system and some of the findings were peculiar to that system. Further details about those findings are available in the HCI Educators 2009 conference proceedings (Pearce & Pardo, 2009).

We have also explored the interactions afforded by *iFISH* in several other contexts. For example, choosing a restaurant based on preferences of: type of food, loudness of environment, degree of formality, age of restaurant, and type of cuisine. In another project a Masters student ran an online experiment investigating the performance of different input devices by giving participants the task of reconstructing a picture using either sliders or steppers as the only method of control.

Conclusion

We have presented the design and behaviour of *iFISH*, an online system that was designed as a vehicle for exploring playful interaction and
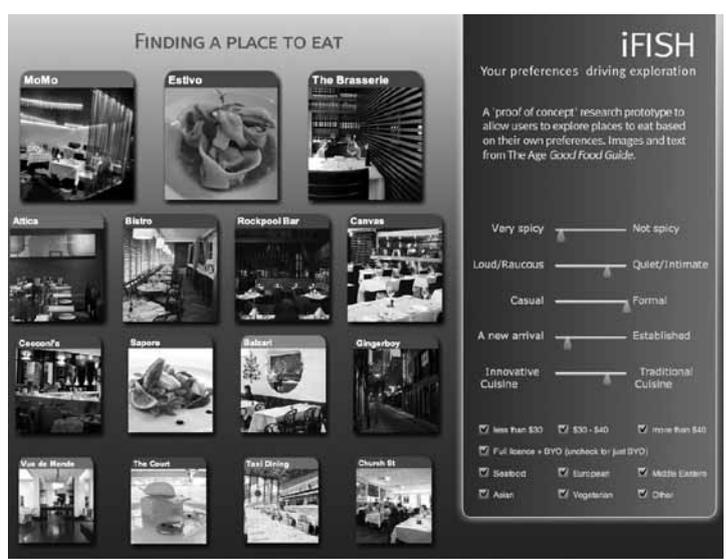
exploration. The system is now expanding as we set up various studies that focus more strongly on user interactions and the role that personal preferences can play in encouraging exploration in playful environments. We believe that there is enormous potential in systems such as these that give full control to the user to explore large data sets based on their preferences rather than knowledge of the data themselves.

Acknowledgments

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Exploring the link between player involvement and learning within digital games

Ioanna Iacovides

Introduction

In recent years, the growing popularity of digital games has caused some researchers to ask how we can 'harness the motivation power of games' to make learning more fun [3, p4]. In addition, the introduction of the latest generation of games consoles has introduced a new set of interaction modes, e.g. the Nintendo Wii, to an even wider audience, in part due to their emphasis on the social side of gaming [8]. However, despite the interest in what makes digital games engaging, there does not appear to be a consistent way of discussing player involvement across games or a complete understanding of how this process affects learning [2].

For instance, some of the earliest work in this area was carried out by Malone and colleagues [4; 5] who proposed a theory of 'intrinsic motivation', which suggested that games are rewarding because of how they combine the elements of challenge, fantasy, and curiosity. Later work added the element of control, and further interpersonal motivators (recognition, competition and cooperation). In terms of the relationship between learning and engagement, Malone claimed 'if students are intrinsically motivated to learn something, they may spend more time and effort learning, feel better about what they learn and use it more in the future' (p335). There is also the possibility that excessive engagement could detract from learning [2].

In terms of learning with digital games it is worth noting that a distinction is often made between informal and formal learning. For instance, Seely-Brown [7] highlights the difference between learning that occurs when playing a game designed to teach something (e.g. 'serious games') and the development of other skills as an 'accidental effect' (p22) when playing games for leisure. It can also be argued that how the player learns to play a game is also a type of informal learning.

The literature suggests that the link between learning and involvement is not clearly understood, while the area itself would benefit from being able to refer to a coherent model of player involvement with reference to what players are actually learning. In order to address these issues, the following research questions need to be answered:

1 How can we identify the learning that occurs during game play?

2 How can we describe the involvement that occurs during game play?

3 Is there an identifiable relationship between the learning that occurs and this experience of involvement?

Design and method

In this study, an exploratory case-study approach was adopted. The methods consisted of a combination of observed game play and a post-play cued interview in which a video recording of the game play was reviewed. A questionnaire assessed their game playing habits and preferences. After a 30-minute gaming session, participants reviewed a recording of their game play and were asked to discuss what they felt and thought as they were playing. Five participants (four male, one female, age range 24 to 52 years) were recruited from the Open University campus on the basis that they played digital games regularly and were asked to bring in a game of their choice to play on the Nintendo Wii within one of the usability labs.

During data analyses, notes for each case-study were produced, consisting of an account of what the players did during the game play session, with reference to what they said about their game play in the post-play interview. The Digital Game Experience Model [1] was then used to analyse critical instances and themes. The DGEM describes aspects of players' experiences with reference to six 'frames'; where 'each frame represents a modality of meaning through which the role-playing experience is interpreted and performed' (p237). The player experience can be described with reference to how the tactical, performative, affective, shared, narrative and spatial frames come together. When the player internalises each of the relevant frames, it can result in what Calleja calls 'incorporation': 'the subjective experience of inhabiting a virtual environment facilitated by the potential to act meaningfully within it while being present to others' (p257). The description of how a player incorporates the different frames is especially interesting from a learning perspective as it gives researchers a way of understanding the relationships between the learning and involvement experienced by game players.

Example case studies

Participant C: playing *Boom Blox*. C had trouble with a specific level within the game. The DGEM was used to describe how, through his repeated attempts, C internalised the knowledge from each frame; specifically the spatial (as he familiarises himself with the structure of the blocks and tries out different camera views), tactical (as he tries

to figure out a strategy) and performative (as he pulls at the blocks and actualises the tactical phase). His initial positive affective involvement gradually turned into frustration since his strategies did not lead to success. He failed to actualise the tactical phase within the performative frame. C lost any sense of incorporation he may have felt, resulting in his quitting the level and deciding to play a completely different type of level afterwards.

Participant D: playing *Guitar Hero III*. In *Guitar Hero*, there is a close alignment between the affective (the music), tactical (the notes on the screen) and performative frames (having to play the notes) that also requires the player to orientate themselves spatially in the environment outside the game (by holding the guitar controller, pressing the fret buttons, and tilting the guitar). When D played songs he had not encountered before (not internalised), he said that these were less enjoyable than familiar songs and suggested there was a need to play new songs more than once to get 'a feel' for them. D's affective involvement when learning new songs is reduced by his need to pay conscious attention to the performative, tactical and affective frames; only once he internalises this knowledge through practice can deeper levels of involvement be achieved.

Findings and limitations

With respect to the research questions it can be argued that the method has potential to further our understanding of how people learn through play as this can be identified by observed progression through the game, while the cued interview can help develop a richer understanding of the processes occurring. If learning is seen as internalisation of the different frames, the DGEM is useful to further

our understanding of what is learnt through play. In terms of involvement, the combined approach of observation and interview allowed for further examination of the involvement that occurred, while the case studies each illustrate how the DGEM could be used to describe specific instances and recurring themes.

The findings illustrate that there is indeed a relationship between learning and player involvement and the DGEM allows for a discussion about how these experiences relate to each other. When the appropriate frames were internalised successfully (through learning), deeper involvement occurred, whereas unsuccessful internalisation led to frustration and boredom and ultimately no involvement. Therefore, the model is useful for considering successful and unsuccessful informal learning within digital games.

While there are some limitations to this study, there appear to be some commonalities across cases. However, further larger-scale studies are required before any concrete claims can be made concerning the relationship between learning and involvement. Furthermore, it is not clear how to use the DGEM to report the results in a systematic manner, while the amount of data that the method elicits could make large-scale studies more difficult. In addition, the current study indicated that it is not clear whether the metaphor of incorporation can be applied to all games.

Conclusions and future work

To sum up, the findings indicate a very close relationship between learning and involvement and suggest that a certain amount of learning is required before deeper levels of involvement can be experienced. The metaphor of incorporation does seem to be a useful one,

as it emphasises a much closer relationship between learning and involvement than previous theories suggest. However, further research is required in order to see whether these findings can be generalised and to consider whether different forms of interaction can be incorporated into this model of game play. Future work could also examine whether different games require different combinations of categories to describe the involvement and internalisation process that players experience.

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Masters at work
iKitchen
Frank Reichert, Fabian Kraft & Thomas Hirt

Masters at work is Interfaces' occasional platform to showcase the work of young designers and researchers. In this issue Frank Reichert and Fabian Kraft present a novel interactive kitchen system that they created as part of their studies at the University of Applied Sciences in Düsseldorf.

Thomas Hirt was a lecturer on interaction design in the design department at Düsseldorf, and some of his recent work has focused on digital media and corporate identity. In 2010 he became Professor for Crossmedia and Integrated Communication at the University of Applied Sciences in Trier. The design department started a new degree programme, "Intermedia Design", covering physical interaction, hypermedia, interactive systems, crossmedia, narrative formats and game design.

The challenge that Frank and Fabian faced was another facet of Thomas's interests: to develop visionary concepts and designs for an interactive kitchen interface. Like those of the other students, Frank and Fabian's project was a collaboration with an industry partner (Gaggenau) so the project was not only about design but also involved the entire product development life-cycle, including a market analysis on which the final design concepts were based.

Introduction

The organisation of a kitchen

The first built-in kitchen was created in 1926, by Margarete Schütte-Lihotzky, who devoted her whole life to the improvement of women's living conditions. Her famous design became renowned as the 'Frankfurter Küche'. Moving forward in time to 1969, Honeywell launched the 'H316 kitchen computer': the first home computer for a kitchen. More recently, Bill Gates proposed an intelligent house in his book *The Road Ahead* in 1996. Anyway that's the past and here is the future.

Nowadays, interface design of all types of media and products is part of our daily life. It helps us to drive (navigation systems), make phone calls, travel, send messages or listen to music. But it is not used so much in the kitchen – a place that truly seems in need of an intelligent work flow; just ask a housewife or a student. Frank and Fabian wanted to change that and aspired to deliver on five things:

> functionality,
>
> effectiveness,
>
> clarity,
>
> simplicity, and last but not least,
>
> fun.

The project

Analysis: many users, one demand

Today's households contain many types of users with different needs and of course using different utensils applied to a diversity of tasks. If you only look at cooking there are at least three discernible and different user groups: first, users who only heat convenience foods; second, housewives who are more than used to multitasking (putting the casserole into the oven, looking after the crying baby and feeding the cat, etc); and third, the gourmets, who celebrate preparing food and all that goes with the experience of enjoying it.

So let's take a closer look at the users and their special needs: the convenience user wants to know why he should eat more healthy food, and what to do with an avocado, for example. The housewife wants to keep track of her cooking as she attends to a multiplicity of tasks and interruptions like answering phone calls, and have the food finished on schedule. The gourmet spends most of his free time in the kitchen. He is devoted to the perfect preparation of his meal and loves to share his experiences. But there is one more user type who is not interested in cooking or even recipes at all. To his mind, it's too complicated and so he would be pleased with what Frank and Fabian have developed for everyone like him.

Solution: a new operating system

The technical opportunities to simplify work in the kitchen are available. Frank and Fabian's goal was to use them properly. They wanted to create a device that is not a distraction from cooking, but rather supports the making of food, because it's so easy to use – and not flashy or intrusive at all.

So how does it work? Every piece of software should have some nice hardware to go with it. In this case, the hardware is made up of a portable display: a 20-inch multi-touch screen. Size and portability ensure that the display can easily be used and anyone can read what it says, even at a distance or in a busy situation. The portability allows the user to take the screen wherever he needs it; and that's not only the kitchen. For instance: the convenience guy can take it to his couch and TV; the housewife can bring it into the baby's room; the gourmet can take it into his vegetable garden to check what he needs for the risotto with fresh herbs. The touch screen is charged via its induction field in the cooking station. Since the screen is likely to come into

contact with oil, liquids and leftover food, it should be washable, and, in the best case, dish-washer safe.

Frank and Fabian paid special attention to the interface design, which offers three different options:

1   Kitchen – every device and everything that needs controlling in the kitchen.

2   Eat & Drink – a large recipe database and special know-how, e.g. what kind of wine with a certain dish?

3   Community – exchange recipes or let yourself be watched or watch others while preparing food – TV chefs are history.

The main part is the Kitchen mode, of course. It proceeds as follows:

Every kitchen device, for example oven, dish-washer, fridge and microwave, has its own section and interface. One can easily control the heat of the oven and start the dishwasher at the same time by touching the screen.

You start every cooking process by asking yourself what to eat. To make it less difficult or to find out what you can do with the food in your fridge, you check out the recipe section. You can filter the recipes according to your preferences. As soon as you click on a certain recipe, you will be shown the ingredients, level of difficulty, duration and links to the technical devices in the kitchen. If you then click on the oven, it will start to heat up according to the recipe. The induction field shows exactly the position of all pans and pots placed on it. That way you can use the place in an optimal way and you don't waste energy. If you want to

invite friends to share the meal, you can easily contact them by using the community function, which allows text messages and phone calls. If your friends can't come over you can have a video-cooking session.

Conclusion: it looks good, it tastes good

By means of their kitchen operation system Frank and Fabian have proved that cooking can be fun even if you are not a chef. They

have also shown that everyone's needs can be addressed, and that not only technical 'nerds' can deal with it. With their concept of a portable multi-touch screen they also fulfil the other four propositions: functionality, effectiveness, clarity and simplicity. The interface is also easily internationalised: the interface design is totally icon-free, and only words need to be changed to use it in every language or country.
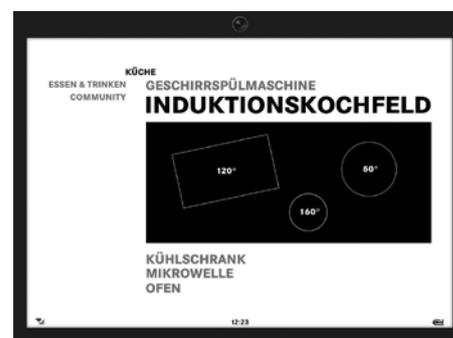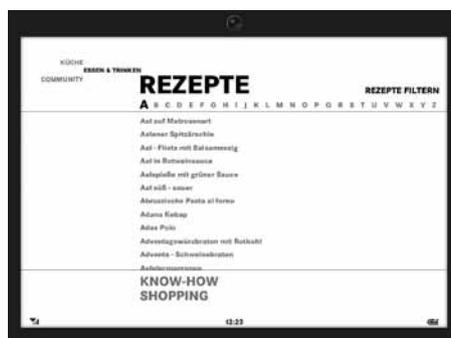
Creativity in design, arts and science

Exploring everyday phenomena: a cross-pollination of approaches

Layda Gongora, Balder Onarheim & Stefan Wiltschnig

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The 7th Creativity and Cognition Conference (CC09) was held on 27–29 October at the Berkeley Art Museum (CA, USA). The focus of the event was 'everyday creativity'. A range of contributions from different scientific fields, as well as the arts, dealt with the varieties of experiences of creative processes and practices. We attended this gathering amongst an interdisciplinary group of five PhD fellows engaged in the EU FP7 Marie Curie young researchers network DESIRE, together with a neurobiologist researching creativity. We are all at an early stage in our PhD projects and the conference was an occasion to learn more about the various approaches to understanding, supporting and facilitating creativity from different perspectives.

DESIRE is part of a European initiative to connect industry and universities interested in creative processes in science, technology and the arts, building networks in multidisciplinary projects. The Creativity and Cognition Conference has been converging around creativity with a committed group of organisers since at least the early 1990s. Originally the conference seemed more preoccupied with artistic output whereas it is now a venue for cross pollination from arts, design, psychology and industry as well as other disciplines.

Along with this type of open dialogue comes a need for common ground, and a search for validity in dealing with the results of research output. This report contains some of our reflections after the conference on observations and conversations during the conference about our PhD projects and the scientific approaches to creativity.

Multiple views on creativity

We generally observed that the word 'creativity' is frequently used without a proper terminology or theoretical framing. Some of the work either included 'creativity' in the presentations just to fit in with the conference theme, or was included because of the popularity of the word creativity. It seems that the word itself still has a 'buzz-word' effect, and that it can be added as part of almost any study – no matter what results the research is hoping for. This is a challenge for anyone new to the field or perhaps working towards understanding creativity, since the word seems to be included, without proper framing, in many studies that are not focused on the phenomenon. One concern that seems to recur when approaching this type of research is: when studying creativity, how can one handle this 'buzz-word' effect?

Unfortunately there are very disparate views regarding creativity, all of which are influenced by different external pressures. For example, because of industry pressures in innovation there is a drive to focus on creative methods and how to make them more effective and economical in their approach. As a result the emphasis is on facilitating innovation instead of perhaps understanding creative processes. A number of presentations focused on industrial examples of applied creativity instead of building an understanding of the underlying processes. In terms of novelty there was much discussion about whether what was observed were simply new combinations or genuinely new approaches and whether one could describe a redesign as something novel. Are we then discussing creativity or ingenuity?

Many of the studies presented focused mainly on the contextual part of creativity. The research was directed towards creativity applied to real-world problems, in contrast to creativity as a phenomenon that needs to be understood in studies in different contexts and at different levels of detail, such as a more holistic vs. a more cognitive approach. Another interesting theme was the role of playfulness in creativity and whether play is creativity or just a type of enquiry. Other themes included generative creativity, artificial intelligence and computational poetics as a form of creative output as well as research itself as a type of creative activity. There was some focus on collaborative aspects of creativity; however, it would have been interesting to see more of this type of work.

Interdisciplinarity as an approach

We have observed a motivation in creativity research to approach it in an interdisciplinary as well as cross-disciplinary fashion. This applies not just to disciplines but also to methodology such as ethnographic or more quantitative methods. Our network of researchers also shares this motivation. As a result it becomes more and more common to focus not just on individual creativity but also on creativity within interdisciplinary teams and on how to organise these different perspectives. Here a 'second order' observation of the observers involved may be necessary: just as the topics and targets of research projects embrace multiple disciplines, the teams of researchers involved in these projects come from varied backgrounds.

All of this is reflected in our own work within the DESIRE network, and among the core group of people with whom we shared the conference experience. It is of vital importance that we form a common ground in order to work together, with a shared language

and increased mutual understanding of the epistemological and methodological foundations stemming from our different disciplinary 'upbringings'. With the attempt to bring together contrasting approaches come questions about the purpose of such efforts and the need to form new blends of methods to address the multiple perspectives involved.

It was interesting to observe the quite strong reactions we had towards the presentation of a project studying creativity in child play with programmable robots, which received one of the best paper awards at the conference. We had the impression that the application of fashionable methodology, expensive tools and rigorous quantitative analysis in a very controlled (if not restricted) environment was considered more important than the contribution to the deeper understanding of the topic of imaginative, creative and open play.

Methods: tension between field vs. laboratory approaches

This discussion hinted at an even deeper level of tension regarding cross-disciplinary approaches. For example, which methods are considered as appropriate and favourable in terms of validity, rigour and generalisable results? The success of lab paradigms has inspired and influenced creativity research. At the same time the richness and nuances of the creative experience may be lost if the complexity of the phenomena studied is not met by the context and the constraints imposed by methodology. If we take interdisciplinarity seriously in that respect too, new relationships and new combinations between approaches from natural and social sciences, and from artistic mastery, need to be found.

As more scientists enter the fields of design and art, and more academic programmes in design and creativity research are created, questions begin to arise about who should be doing the research? Is it the role of the creative or of the scientist? In the end one is left wondering who the expert is and who is studying whom and which perspective is the most valuable. It may be that research which contrasts laboratory studies and real world studies would be useful in an effort to access both worlds.

However, the biggest challenge is that in some cases the researcher may not set out with a clear hypothesis in mind, and with regard to creativity research it is not always the case that results can be reproducible. How do these standards fit into the study of open-ended processes and ill-defined problems like creative processes in design and the arts?

Looking forward

The questions below summarise some of our reflections and starting points for our own research.

1 One of the main challenges for innovative research is the ability to accommodate opposing findings and polarities shaping the context for creative processes. How can we get from decisions between either/or to both, and structures of argumentation?

2 The buzz-word character of the term creativity currently creates a lot of attention for the field; but the ill-defined nature or breadth of meanings attributed to 'creativity' create difficulties in aligning efforts by researchers from different disciplinary and methodological backgrounds.

3 Interdisciplinary work is a key characteristic of creativity research. This is mirrored in the diversity of the people involved in our work contexts in the DESIRE network. We hope to contribute to a shared understanding that allows for bridging and combining approaches from various backgrounds.

4 A special challenge and excitement lies at the intersections between science, industrial practices and creative work. Perhaps these linkages are in themselves a type of research strategy whereby we are looking for patterns in the knowing and practices surrounding 'creativity'.

5 New topics and research questions constantly emerge from overlapping fields and methodologies, yet one must be careful not to assume that conducting research that is a collage of approaches from other areas will solve concerns regarding the complexity of the phenomena involved in creative experiences.

Finding passageways between state of the art scientific rigour and the flexibility of artistic work or 'designerly ways of knowing' will be an ongoing challenge when dealing with the unique and unpredictable aspects of creative processes in everyday life.

Creativity and Cognition website: http://www.creativityandcognition09.org/
DESIRE network: http://desirenetwork.eu/

A model-based software tool chain for developing multimodal user interfaces

Gerrit Meixner

This article focuses on the development of an analysis tool as a part of a software tool chain for model-based development of multimodal user interfaces and describes an ongoing research topic at the DFKI in Kaiserslautern, Germany.
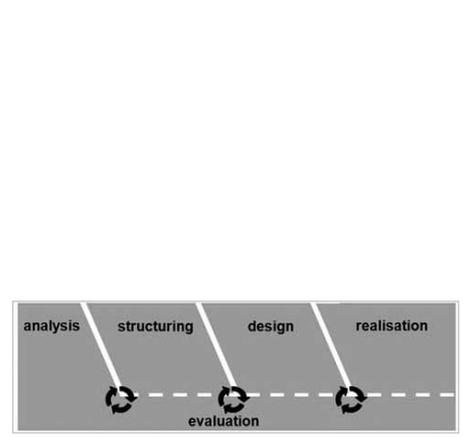
Figure 1 Useware Engineering Process
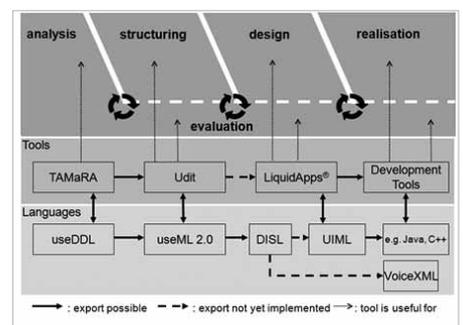
Figure 2 Model-based software tool chain

Introduction

Considering the interaction with technical devices such as a computer or machine control panel, the user's perspective renders the classic division of these devices from components into hardware and software. Users actually interact with a subset and intersection of these hardware and software components, which, in their entirety, make up the user interface. From this perspective, however, we need to question the common practices by which hardware and software specialists develop user interfaces, because this way, we disregard probably the most important component of an interactive system – the user!

Moreover, in a highly competitive market bringing forth technically and functionally more and more equal devices, user-friendliness as an additional sales argument secures a competitive advantage. To put stronger emphasis on users' and customers' needs, wishes, working styles, requirements, and preferences, and to consider them right from the beginning in all phases of the device development process, responsible professional organisations in Germany, i.e. GfA, GI, VDE-ITG, and VDI/VDE-GMA, have already, in 1998, coined the term "Useware" for the before-mentioned subset and intersection of hardware and software. They have also defined a systematic Useware Engineering Process (Zuehlke and Thiels, 2008), which

demands a comprehensive user, task, and use context analysis preceding the actual development, following the ISO 13407 standard. In the further course of the Useware Engineering Process, interdisciplinary teams of, for example, computer scientists, mechanical engineers, psychologists, and designers, continue developing the respective device in close collaboration with the ordering customer and her clients, by constantly providing prototypes even in the very early stages of development phases, thereby facilitating a continuous, parallel evaluation (as depicted in Figure 1).

Already, in the initial analysis phase, this rapid prototyping necessitates quick processing of the disposable results of the ongoing analysis; during the subsequent development phases and the evaluation, access to the processed results and the elevated raw data must be provided at any time.

After the initial analysis, an abstract, hardware- and software-independent concept of use is deduced during the structuring phase of the Useware Engineering Process. In spite of its abstract nature, however, this concept must be intelligible to the ordering customer and her clients, who effectively demand a model-based approach allowing for (semi-)automatic generation of – admittedly still rather simple – prototypes. For this purpose, user tasks, working styles and goals elevated during the analysis are integrated into individual task models as a first step. Subsequently, all individual task models are merged into a single use model focusing on interactions between the technical device(s) and its user(s). These use models are formalised employing the Useware Markup Language (useML) (Meixner et al., 2009)

and can then be processed electronically. Only after hardware- and software-independently structuring the use model are hardware- and software-specific parameters and design aspects taken into account. These include, for example, appropriate interaction paradigms, interaction devices, representation styles, colour schemes, the corporate identity, and cultural design aspects. Hereby, the derivation of more detailed, platform-specific concepts builds the base for the eventual realisation of the actual device by average hardware and software developers. It is obvious that a systematic process as complex as Useware Engineering must be supported by a range of dedicated software tools (see Figure 2).

The following sections present a software tool for the analysis, which is already available: TAMaRA and its underlying data language useDDL. The other tools and languages as depicted in Figure 2 are not the focus of this short research study.

Tasks, Activities, Models and Requirements Analyzer (TAMaRA)

With the "Analysis Tool" and its modeling language, useDATA, (Meixner et al., 2008), a first software tool to support the Useware Engineering Process had been introduced by Boedcher (2007). Its ease of use as well as its instantaneous analysis of input data significantly simplified and quickened electronic data collection during the analysis phase. The core of the Analysis Tool is its generic requirements catalogue, which initially comprises 36 default data categories, but can be adapted to specific projects even during the process of an ongoing analysis. This catalogue

allows for recording quantitative data (e.g. statistics) and qualitative data (such as individual statements by users) as well as model-based and other structured input (like task and use models) (Meixner and Thiels, 2008).
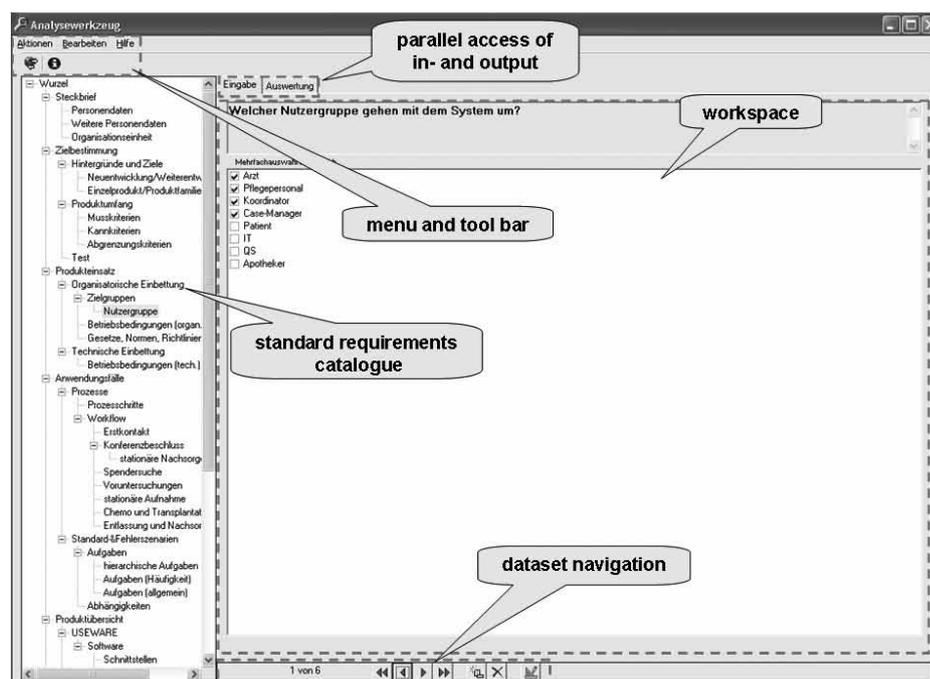
Figure 3 The first Analysis Tool for the Useware Engineering Process

The Analysis Tool (see Figure 3) has proven its worth in real projects "in the field". However, as expected, additional requirements to the Analysis Tool itself were identified then, such as multilingualism and an autarkic data management and storage mechanism independent of previously installed database systems (Meixner et al., 2008).

In a consequent step, a second analysis tool named "TAMaRA" (short for "Tasks, Activities, Models and Requirements

A model-based software tool chain for developing multimodal user interfaces

Gerrit Meixner
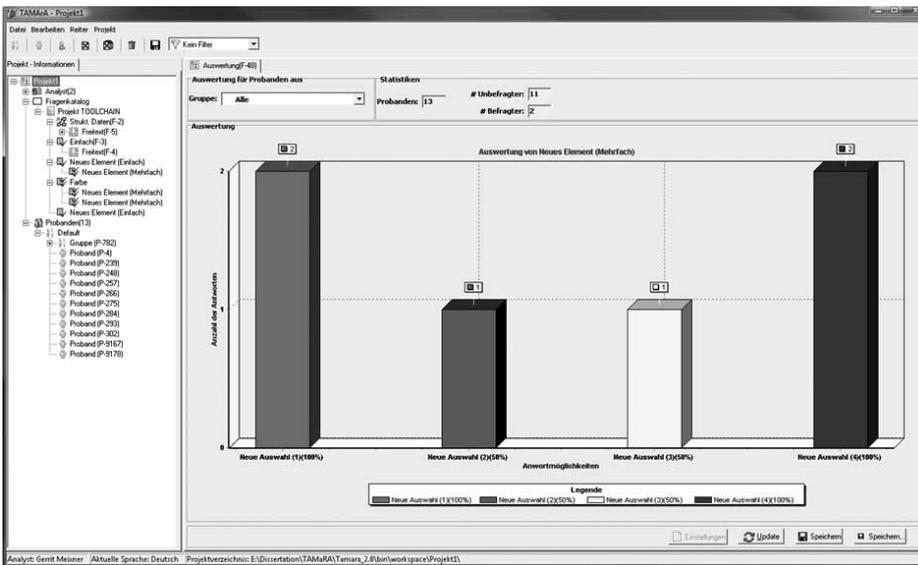
**Figure 4** Screenshot of TAMaRA
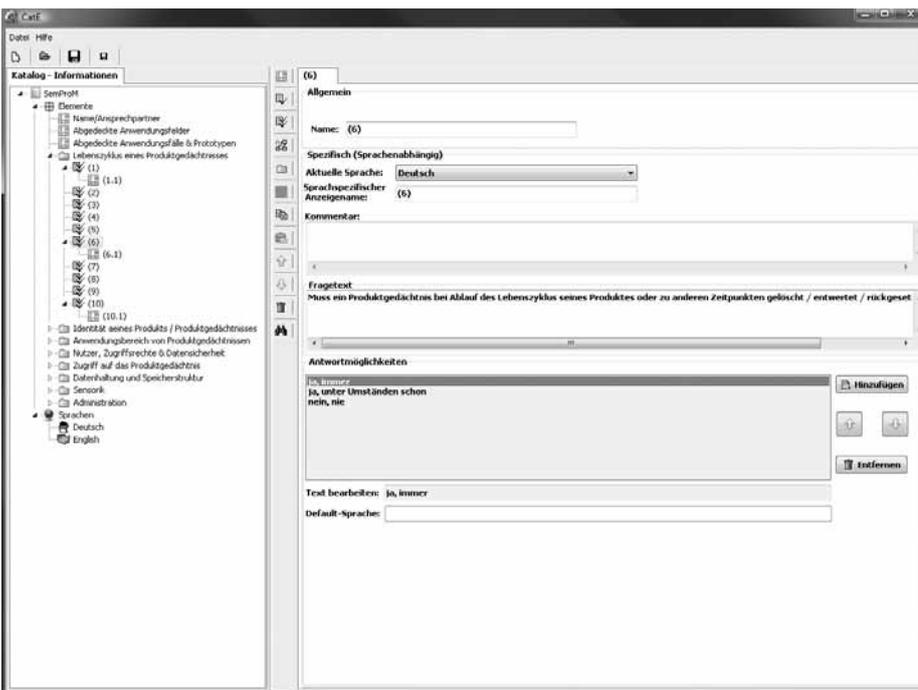
Figure 5 Screenshot of CatE

Analyzer") was developed to satisfy all the newly identified requirements as well as to incorporate new features. Particularly with regard to its ease of use, TAMaRA (see Figure 4) was split up into two separate tools to outsource the creation and editing of the requirements catalogue into a separate Catalogue Editor named "CatE" (see Figure 5).

CatE focuses on the specification of the requirements catalogue prior to the accomplishment of the actual task analysis, but also guarantees for data integrity and consistency when the catalogue must be changed during the analysis or retroactively.

During the course of the analysis, TAMaRA allows for role-based differentiation between the analysts involved, to ensure the traceability of each analyst's data input. In addition, TAMaRA not only stores data accumulated during the analysis, but evaluates data about the project itself, such as the number of questioned users per analyst (see Figure 4). The user is able to apply filters upon all accumulated data, highlighting, for example, solely plain text input from interviews or solely structured data (such as individual task models) in TAMaRA. These filters speed up and ease the use of TAMaRA as well as the immediate sorting of newly entered data and the search for already stored data.

All accumulated data is stored in an XML dialect named Useware Data Description Language (useDDL, see Figure 6). The resulting XML file is platform-independent and can be copied to other computers easily. TAMaRA itself runs on Windows without any prior installation, requiring only the .NET framework.
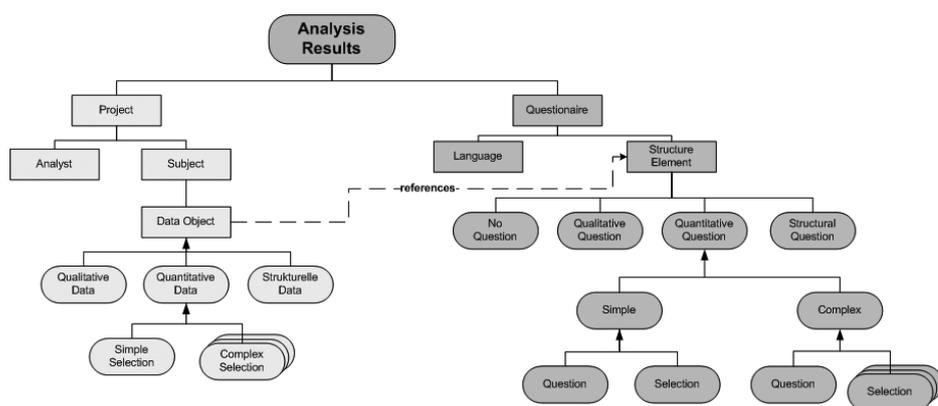
Figure 6 Data structure of the Useware Data Description Language (useDDL)

About the author

Gerrit Meixner got his diploma (2005) and his Masters degree (2007) in computer science at the University of Applied Sciences in Trier. Currently he is finishing his PhD thesis in the field of model-based user interface development at the University of Kaiserslautern. Since March 2007, he has worked as a researcher in the field of human–computer interaction (HCI) at the German Research Center for Artificial Intelligence (DFKI). He was co-organiser of the USEWARE 2008 conference in Baden-Baden, Germany, and chair of the MDDAUI 2009 workshop at the IUI 2009 conference in Sanibel Island, USA. He was co-organiser of the MDDAUI 2010 workshop at the CHI 2010 conference in Atlanta, USA.

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Concluding remarks

This short research study about the analysis tool TAMaRA and useDDL is part of ongoing work on the development of a model-based software tool chain for developing (multimodal) user interfaces. TAMaRA has also proven its worth in actual real projects "in the field" concerning the development of user-centred interfaces in the area of industrial projects (e.g. pump control systems, control valves and positioners). Future work will include further evaluations and optimisations of TAMaRA. The next generation of TAMaRA could include pen-based interaction with a tablet PC for more intuitive and natural information gathering and input potential.

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Usability challenges in e-learning

Anita Dutt

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Introduction

E-learning can be defined as a form of learning or education where the medium of instruction is computer technology. However, this can be interpreted in many different ways and many different forms currently exist.

Companies tend to view e-learning as a policy statement explaining how they will use IT in their company to deliver training to their employees. Universities and colleges around the world use e-learning for long-distance courses where students rarely, if ever, attend the campus as studying takes place online. In more recent times, there has been a growth of online colleges and universities that offer academic degrees and certificates wholly over the Internet.

Alternatively, *virtual learning environments* (also known as learning management systems or content management systems in the USA) are increasingly being used by the British education sector to manage student learning. Besides offering a repository for course materials which can be viewed by students on and off campus, virtual learning environments provide many other facilities, for example: setting up and managing virtual classes; providing forums; managing student assignments and marks; and, broadcasting announcements and events related to particular courses. Forums in virtual learning environments enable learning as they are based on the social constructivism theory of learning in which learning is assumed to be an active social process where individuals develop their knowledge about a subject through interactions with each other and with the environment they live in.

In addition to formal learning environments, websites featuring technologies like RSS feeds, bulletin boards, blogs, wikis, podcasts and webquests are sometimes treated as e-learning. There has been rapid growth of educational websites offering learning activities and educational games that use multimedia and animation, such as the BBC Bitesize website.

Instructional software is another type of e-learning that is either available on CD-ROMs and DVDs or is bundled as help systems and tutorials into computer applications. Sometimes, tutorials for computer applications are delivered via the Internet as in the case of Microsoft and Adobe applications.

An interesting development in e-learning is the production of reusable learning objects for teaching specific skills. Reusable learning objects are pieces of software designed by experts to teach a small set of skills. They can be purchased and customised by organisations to improve their course provision for specific subjects.

Usability issues of current e-learning technologies

E-learning technologies present many different usability and interaction issues that have not yet been fully addressed.

In the case of virtual learning environments, students sometimes have difficulty finding the particular course material they are looking for. Some of the features like forums and those related to managing students' assignments are difficult to learn to use. Screens presenting information to students may have too much information which leads to information overload. Help information may be quite general and users can have difficulty applying it to the task they are trying to complete.

Instructional software may contain lengthy, complex explanations which are difficult to understand and not particularly engaging to users. They do not always cater for different learning styles of users.

When new versions of a software product are released with extra functionality not seen in earlier versions, the overall functionality of the product becomes more complex and consequently the explanations given in the product's help system are more complex and more difficult to understand. So, more recent versions of a software product may provide less usable help systems.

Educational websites offering multimedia learning activities and reusable learning objects tend to focus on small "chunks" of learning or a small set of learning objectives. The author has observed many instructor-led classes where educational websites and learning objects were used (as well as leading such classes herself). It was noted that learners used these websites for a small part of their lesson and not for the whole lesson as they tended to lose interest in the website well before the end of the lesson and preferred some kind of instructor intervention during the lessons. Their behaviour may be caused by the e-learning products not being sufficiently engaging or by the cultural norms of learning in classes. We tend to be brought up on the concept that a teacher is central to learning in a class. Such cultural views may limit the take-up of e-learning products.

Development of an e-learning software product using HCI theory

The overview of e-learning technologies presented in the introduction illustrates that e-learning is a vast subject. In light of this, the best way forward was to select a small area within e-learning and research the usability issues related to that area, in this instance, the area of instructional software.

The aim of the project was to develop an e-learning product for the school and college curricula which provides instruction and provides an user experience that is natural, engaging and enjoyable. It was envisaged that the product would be used in a learning environment where the presence of an instructor was not necessary.

An e-learning product was developed that taught learners the following: how to create charts in Excel; to understand that there are different types of charts; and to know when to use the different chart types.

The e-learning product was divided into two sections and at the end of each section there was an activity which users could do in order to check that they had understood the content of each section.

The e-learning product was built in an iterative, user-centred manner: a prototype was first developed and this was followed by cycles of user evaluation and re-design. The first prototype was built in accordance with Gagne's model of instructional design (Hussein, 2005) and Nielsen's usability principles (Nielsen, 2008).

The users, and therefore evaluators, were 14-year-old school students who had no previous experience of Nielsen's usability principles. The user evaluation stage had to be adapted so that it was simple enough for the student evaluators to learn quickly and carry out confidently.

The prototype was web-based and compatible with different web browsers. Content was compatible with the different learning styles of the users. These learning styles were visual, audio, text-based and kinesthetic. Explanations were kept as simple as possible so that they would be easily understood. After developing the first prototype, a user evaluation was carried out on it.

Screenshots of the prototype

A sample selection of the web pages in the prototype is presented on page 20 to provide readers with the overall "look and feel" of the prototype.

Evaluating the prototype

The evaluation took place in a secondary school and the author was allowed one hour by the school to conduct the evaluation. Evaluators were five 14-year-old students with a good ability in the subject of ICT. All evaluators had experience of evaluating software products using simple criteria, e.g. what they liked and disliked about a product. All evaluators had used Excel before and some knew about the charts feature in Excel.

The student evaluators had no experience of using commercial techniques for measuring usability like heuristic evaluation and walk-through evaluations. From previous experience (Dutt, Johnson and Johnson, 1994), it appeared that these techniques required considerable training time and there would not be enough time to train the evaluators adequately. It appeared to be more constructive if evaluators explored the website as they wished and noted down the features they liked and those that they disliked.

The evaluation of the e-learning resource took one hour. Students evaluated the prototype individually and noted down its strengths and weaknesses. This was followed by group discussion of their findings.

The strengths of the prototype identified by the student evaluators were:

- The information on the e-learning product was easy to read;

- Videos were good and the voice in the video was clear;

- Evaluators liked the "end of video" message at the end of the videos;

- Links on the website were good and easy to understand. When an evaluator finished a page they knew where to go next;

- Good instructions;

- The e-learning product asked questions on what evaluators learnt;

- Questions were clear;

- Exercises that users could try out to test their understanding of the content were easy; and

- The website was laid out well and was easy to understand.

Usability challenges in e-learning
Anita Dutt
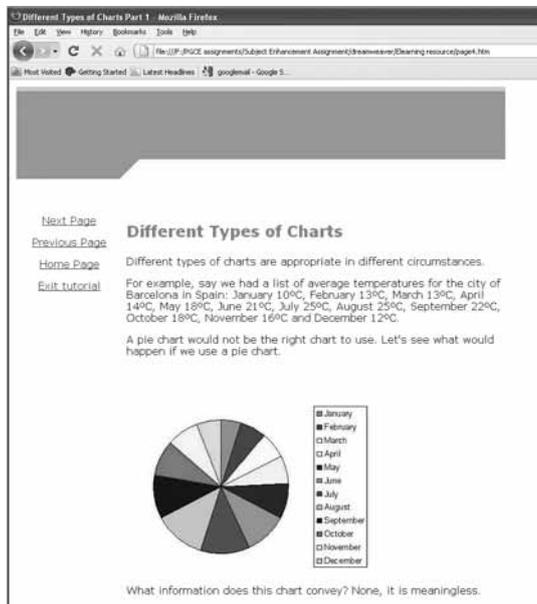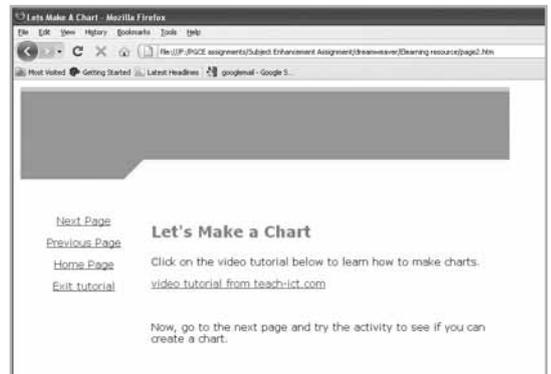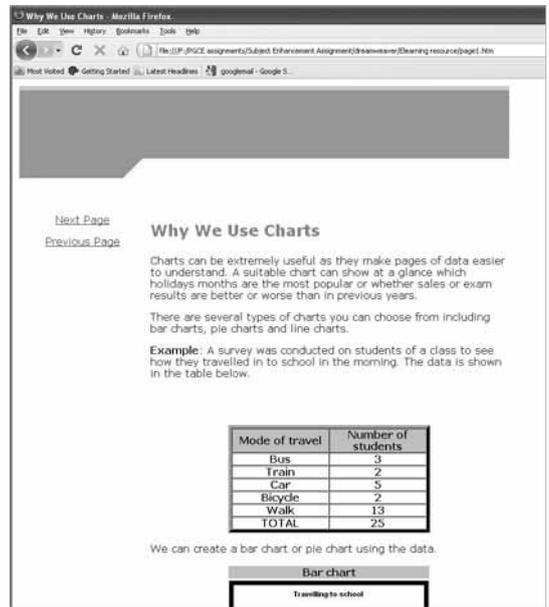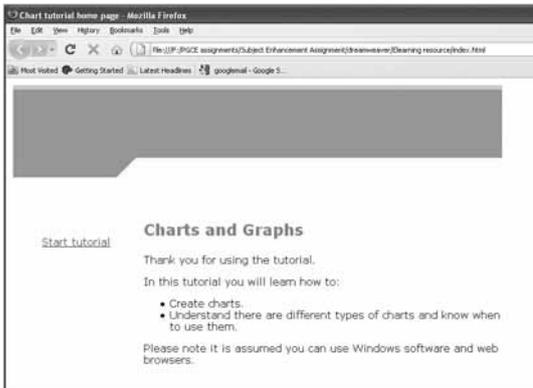
The weaknesses that the student evaluators identified were:

- The axes labels on the charts should be bigger;
- Evaluators had problems understanding what chart legends were;
- Some evaluators wanted more pictures and more colour; and
- Evaluators were unsure about how to return from the videos to the website.

This information has been used as input to further cycles of re-design and evaluation before the product is finalised.

The prototype has a troubleshooting facility that supports users if they have questions after using the product. At the moment, it involves clicking a hyperlink to launch an email tool and sending an email to a "troubleshooter". The troubleshooter goes through all the emails in their inbox at regular intervals and replies to each email. A future improvement will be to provide real-time support so that users' questions are answered immediately. The troubleshooting facility allows the creator of the product to enlarge the product and add more learning objectives to it. If this increases the number of questions users have, then the troubleshooting facility can manage the increase. In this way, the prototype overcomes the limitation of instructional software only managing "small chunks" of learning.

Conclusion and future directions

This paper has presented a brief overview of the vast field of e-learning and associated usability issues. Although the set of usability issues discussed may not be exhaustive they illustrate that current e-learning technologies have not explored usability thoroughly enough. It is possible to apply HCI theory to reduce the usability issues with e-learning environments, as illustrated in this paper. The product's troubleshooting facility allowed learners to ask questions about their learning and made the product more robust and flexible to changes so that extra learning units could be added to the product without affecting its performance.

In future, we would like to extend the product as follows:

1 Extend the troubleshooting facility so that users' questions are answered immediately (i.e. real-time).

2 Research and extend user interaction theories for collaborative learning environments where learners are separated geographically. Such theories can help e-learning practitioners build e-learning products with collaborative learning facilities cost-effectively and efficiently.

3 During the build of the first prototype the context and the environment in which the prototype would be used was considered. It would be useful to develop theories on how to create e-learning products that effectively fit into the environment of the learner and the context in which they learn. It may be useful to apply theories from the fields of ethnography and work psychology to e-learning.

4 We would like to include more multimedia in the prototype. Gagne's theory of instructional design does not appear to provide any advice about creating suitable multimedia features for an e-learning product. From the user evaluation it is clear that potential users for e-learning products are familiar with multimedia human–computer interfaces and expect some form of multimedia to aid instruction. As potential users become more experienced with newer forms of human–computer interfaces such as touch screen technology and 3D virtual worlds in which a user can be represented as an avatar, instructional software may have to find a way to enable learning through these forms of interfaces. Therefore, e-learning practitioners will need suitable theory to direct them in the creation of high-quality instructional software that incorporates the latest popular forms of human–computer interfaces.

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Volcano inspired research

Janet C Read

The ACM CHI conference in Atlanta will primarily be remembered by the British participants as the one in which they got 'volcanoed'. Hours before the UK (and European) delegates were about to leave the muggy heat of the south, the most Northern parts of Europe were conspiring against these same travellers by sending out, into the sky, a volcanic ash cloud.

The rest of what happened is probably reasonably well known – British researchers did what the Brits do best – they didn't panic and they got themselves organised. Some decided to make for the hills and hang out with other strandees, others took to the road, some stayed in Atlanta, some decided to work, some decided to holiday.

A Facebook group, ''Brits waiting for the dust to settle'', was set up, rendezvous were arranged, parties held and one local hostelry was even persuaded to design a volcano cocktail for the strandees. As the time passed, some delegates considered moving into the property market – after all, it could be a while before the flights resumed ☺.

The time spent between the ending of the conference and the eventual flights home was interesting to ponder. Initially there was a panic moment – find a hotel, re-book a flight, do the washing. The weekend fell and the sun was shining and there was an allowable period of relaxation but this was interrupted the whole time by questions about where everyone was, when did others have flights out, was anyone leaving? Underneath the relaxed façade, each strandee was keeping a cocked ear, much as a cat does when sleeping, keeping tabs on what was going on.

Most of the strandees had their second flights cancelled shortly after the weekend and at that same time, as universities back in the UK started to react to the situation, there was a feeling that some work should be done; stranded yes but still on the payroll! Georgia Tech opened the labs for business, desks were given out, email accounts created and emergency food was supplied!

For maybe a day, but it felt like forever, the situation started to feel a little bit permanent; then, just as the days were starting to feel semi-normal, news started to filter out of people getting out, of planes leaving, of tests on engines and of new routes home being made available. This news unsettled people – it was like there had been a one-day sale of bargain items, no-one really wanted to be the one who didn't get to see what was on offer.

As the week wore on, the group of UK strandees started to diminish, slowly people were moving out – to the airports and eventually to their homes. Facebook provided the space to report on safe landings, people who had only been passing acquaintances had shared a small slice of their lives in a totally unexpected situation and as these ties were severed there was a small sense of loss – yes, we were back home but what of that little temporary home that had been ours for a few days?

Everyone who was volcanoed, and not just those volcanoed in Atlanta, was affected by the hiatus in their lives. As academics, it is our nature to examine such things and there are undoubtedly many tales that could be told of the social interactivity, the cultural behaviours and the communication methods that were appropriated at that time. It is interesting to consider, from a very practical view, what actions the strandees took during their absence from the UK, and to examine how these actions might be taken forward to create a fitter, better, healthier population of UK HCI researchers.

Volcano inspired behaviour

In the event that any of you reading this article find yourselves volcanoed, here is a list of eight things that will help get you through the ordeal. These have all been tested by the UK volcanoed HCI academics.

1 Find out where they sell two dollar beer – this will make you feel you are in control and that you belong

2 Take in your friends' washing – this will make you feel you are doing good to others and dealing with practical things

3 Throw a party – this will make you feel sociable and will keep you in touch with people

4 Take special care of those who are alone – this will help you to keep a perspective but will also satisfy your need to care for others

5 Keep fit and keep active – this will help you sleep and keep you from getting too anxious

6 Create a social community – this will provide you with news and support

7 Enlist the support of outsiders – this will help you keep a perspec-tive and will increase your sense of being cared for

8 Enjoy the experience – when it is all over, you will be able to have some good memories ☺

Volcano inspired research

The eight principles above were all found to be useful in Atlanta; back home in the UK it is interesting to consider if any of these principles can be carried into the everyday life of the HCI academic. Some starters are presented here:

1 When you find out a deal (be it a research call or a job opportu-nity) share it.

2 If you have equipment and/or talents let others know what they are and share them – too many HCI groups and people fail to let other groups know what their expertise is.

3 Be sociable – invite other researchers to your events, to your labs

4 Bring in the people who are new, or are not in big groups. Too often groups always work with the same people and it is hard for newcomers to get experience in examining and research bids.

5 Keep moving – not much to say here except that a mixture of things is better than just one!

6 Nurture the community – this is our community – this is our magazine

7 Let people outside HCI know what we are doing – we won't get support from them if we don't tell them

8 Enjoy the job ☺

Being volcanoed was certainly unsettling. For a week or so after the event, many people commented on having difficulties focusing; it was hard to stay on task, it was difficult to complete things. In this situation, altered methods were needed to get you through the week and get jobs done. Now it is all a haze… some of us have even thought about flying again!!!!

Top: Eruption of Eyjafjallajökull Volcano, Iceland. NASA image by Robert Simmon, using ALI data from the EO-1 team. From Nasa Goddard Photo and Video http://www.flickr.com/photos/gsfc/4584266582, used under Creative Commons attribution licence.

Above: Mount Etna Eruption. Image courtesy of Earth Sciences and Image Analysis Laboratory, NASA Johnson Space Center; photo number ISS005-E-19024 from http://eol.jsc.nasa.gov

Opposite: Eruptions at dawn: smoke display from Arenal Volcano at 7am © Nikki Tysoe (Fimb on Flickr®). http://www.flickr.com/photos/fimbrethil/1779804696, used under Creative Commons attribution licence.

Profile

Lynne Coventry

talks to Jennefer Hart

Can you start off with a little bit about your background? You have a mixed background, so how would you describe what you do?

I completed a joint degree in Psychology and Computing Science, an MSc in Software Engineering and a PhD in HCI. At this time, in the early eighties, I managed to complete a degree in computing without actually seeing a "real" computer – only the screen and keyboard. Only the "clean" people were allowed access to the computer room. I now carry more computer memory around my neck, on my USB, than I could ever have imagined needing, or physically carrying at that time. What I have been interested in is the area of intersection between the computer and the human and how computers can be designed to augment human abilities rather than compete with them. I was also interested in learning how to write programs so that they are comprehensible by both the computer and other humans who need to understand what they can do and potentially where they might not work.

You spent quite a few years working in industry as a usability consultant. What type of work did this involve?

In the early days I was seen as an evaluator on development projects but slowly moved forward in the process to HCI researcher. Designing the interaction is about more than usability. HCI research was part of the proof of concept process. During this process new ideas were prototyped and evaluated from a business, technology and usability perspective before being committed to development. At the end of this process we had a clearer idea of the requirements for the product, and the final prototypes served as targets for the final development. My role was to identify barriers and opportunities to acceptance of new technology.

Can you give some examples of your past projects – where considering the user needs made an impact on the development process?

I worked for a number of years on biometrics and was one of the first people to test biometrics in a realistic environment and explore their effectiveness for a broad spectrum of users. I also explored the relationship between user instruction, user behaviour and false reject rate.

What brought you back into academia?

I was asked to join Northumbria University and develop the industry links for PaCT Lab. Over the years I had seen University and Industry come together and then drift apart again. I think it is key for people who have an industry perspective to get involved with academia rather than just complain that academia doesn't deliver what they need.

You're now Director of PaCT Lab. Can you describe the focus of research there?

At the Psychology and Communication Technology (PaCT) Lab we explore the ways in which new communications media affect our everyday interactions and choices. The research has focused on the domains of e-commerce and e-health as well as social networking. The work we do revolves around four key questions:

How do we design for trust?
Why and when do we feel secure in disclosing information?
What types of privacy do we seek to protect?
How can we design more usable security solutions?

Can you give some examples of your recent research projects?

I have just finished a JISC-funded project exploring the factors that affect students' trust in online information and the role of said trust in their intention to reference a piece of information. I am currently working on a TSB assisted living project looking at the role

of communication technology in supporting independent living for older adults.

What interests you most about this area of research?

Coming back into academia it was good to start with a project that looked at students' acquisition of knowledge and attitude towards learning, as for designing for older adults – I am just designing for my near future self. Though in general I like my research to have an applied element.

Your previous research has been in the field of privacy and security. Can you tell us how you became interested in this area?

The more discussion groups I carried out with bank customers the more I realised that the general public understanding of system security did not match the real security and it was always interesting to hear anecdotes of the myriad of ways they circumvented security for convenience and to avoid embarrassing situations. This got me interested in how we design and communicate security to users.

You are most known for your research on usable security and biometrics. Have you seen a growth in the use of biometric products?

Yes but not in this country. I mean you now must leave two full sets of fingerprints and a photograph when you enter the USA. You would have thought they could have incorporated a bit more ergonomics into the layout of that equipment – I am sure I am not the only person shorter than 5 foot 6 to enter the States.

Do you think biometrics will be used in commercial products, such as ATMs?

They already are, just not in this country.

Are there any ethical issues that need to be considered?

I think we always need to be wary about ethical issues with the introduction of any new

Lynne Coventry is the Director of PaCT Lab (Psychology and Communication Technology) at the University of Northumbria. Lynne is best known for her work on usable security, particularly biometrics. Her new research is exploring the role of communication technology in the lives of older adults to facilitate mobility and inclusion. She is an applied researcher who enjoys working in multidisciplinary teams to solve real problems. She is keen to explore new ways of integrating psychology into design and would also like to see HCI as an accepted part of psychology.

technology, and the biggest issue raised has always been about privacy, but to me biometrics are generally open to the public – everyone can see your face, can photograph your iris, you leave your fingerprint everywhere. Yet the same people complaining about invasions of privacy are happy to leave impressions of their most intimate lives and opinions, which should stay personal, on Facebook. My biggest concern is that organisations with no understanding of securing data are collecting and holding unencrypted biometric templates.

Do you think improving accessibility and usability has an impact upon security and privacy?

Not if the solution is designed properly. I think people's attitudes have a bigger impact. We still have not found a usable/accessible solution without compromising the current level of security, and we have not designed a secure solution that people do not compromise in some way. The two disciplines need to learn to communicate more effectively to jointly solve the problem.

Do you see biometric products becoming more widespread as the technology becomes more robust and usable? Do you think we are heading for a biometric infrastructure?

Yes to the first question and no to the second.

What are the future challenges of using such technology that will need to be overcome?

positive hype. negative hype. not ready for purpose. getting correct application. weather. risk. health concerns. government. politics. media. stable biometrics. aging. accidents. everything really.

Why do you think usability is so popular today?

Usability is an enigma or even a conundrum – anyway do we really know what we are looking for and will we recognise it when we find it and

even better will we be able to replicate it – in any universally agreeable way?

Is the user always right?

No, the user sometimes doesn't have a clue what they want, need or what solutions will work. They forget that their opinion might not be representative of the wider community and are easily influenced by marketing propaganda, the way the question is put to them and trying to give the "right" answer. I tend to use user opinion (especially if only a few people have been asked) as only one source of data when making a decision.

Now for some questions about you

What devices do you own?

Well the most useful is my portable external hard drive to help me collate all my data from all the different devices – my work laptop, personal laptops, digital camera, digital video camera, digital music player, iphone (had to get one to argue from a point of knowledge rather than prejudice), etc. Don't trust clouds.

What is your favorite design (object)?

My swarovski crystal and silver heart USB stick – better place to keep my intimate memories than Facebook.

What was the last book you read?

Doctor Dog by Babette Cole. Commonsense medical advice for young children with some good rude fun.

What annoys you the most?

The "am i bovered" attitude. I can't stand people who spend their time figuring out how much (or rather how little) they can get away with.

When or where are you happiest?

Cannery Row in Monterey at the wine tasting rooms with a glass of wine, some cheese and

biscuits watching the sea otters play as the sun sets on the horizon.

What is the most adventurous thing you have ever done?

Nothing that I am prepared to go public with.

How do you spend your free time?

Filling in silly questionnaires – especially ones with prizes attached.

What cartoon character best describes you?

Well I would say Betty Boop though in my recent poll on the issue the reply was Mutley from Dastardly and Mutley fame – you see why I don't trust user opinion ;-)

Who has influenced you most in your life?

My granny

What would your dream house be like?

Clean and tidy ☺. Set on a beach with glass walls allowing the living space to flow into the sea. With real fires, a big bath, and a ready supply of red wine in the winter and champagne in the summer.

When did you last laugh?

When my nephew tried to walk on the grass in my stilettos and ended up embedded in the ground.

When did you last cry?

Watching UP

Where did you spend your last holiday?

California – driving up the coast from Los Angeles to San Francisco broken up with a bit of voyeurism watching sea elephants mating.

What is your favourite piece of music?

Bitch by Meredith Brooks to get motivated, Bat out of Hell by Meat Loaf to get ready to party and for general listening Debussy.

What is your idea of paradise?

Sunny Friday afternoons, work finished – or at least put aside, gin and tonic and mezze.

Intercom

Interacting with Computers

Dianne Murray

The current issue of Interacting with Computers is a Special Issue, edited by Tim Bickmore and Gavin Doherty, on the topic of Supportive Interaction: Computer Interventions for Mental Health. It is available on ScienceDirect at http://www.sciencedirect.com/science/issue/5644-2010-999779995-2041800.

Volume 22, Issue 4, Pages 241–312 (July 2010)

Editorial: Gavin Doherty, Timothy Bickmore

Design and evaluation guidelines for mental health technologies.
Gavin Doherty, David Coyle, Mark Matthews

Problems people with dementia have with kitchen tasks: The challenge for pervasive computing.
Joseph P. Wherton, Andrew F. Monk

Using a touch screen computer to support relationships between people with dementia and caregivers.
Arlene J. Astell, Maggie P. Ellis, Lauren Bernardi, Norman Alm, Richard Dye, Gary Gowans, Jim Campbell

Maintaining reality: Relational agents for antipsychotic medication adherence.
Timothy W. Bickmore, Kathryn Puskar, Elizabeth A. Schlenk, Laura M. Pfeifer, Susan M. Sereika

The therapist user interface of a virtual reality exposure therapy system in the treatment of fear of flying.
Willem-Paul Brinkman, Charles van der Mast, Guntur Sandino, Lucy T. Gunawan, Paul M.G. Emmelkamp

What's coming up?

Forthcoming plans are for two more Special Issues, along with our regular papers. The running orders have yet to be finalised but the next Special Issue will be Volume 22, Issue 5, and will be on the topic of User Experience, very ably managed by Effie Lai-Chong Law and Paul van Schaik. These Editors precede the collection of papers with an important critical introductory paper defining an agenda for research and practice in user experience modelling. The selected five papers for the Special Issue, 'Measurement and Structural Models of User Experience', are as below:

The usability metric for user experience
Kraig Finstad

Measuring the dynamics of remembered experience over time
Evangelos Karapanos, John Zimmerman, Jodi Forlizzi, Jean-Bernard Martens

More than a feeling: Measurement of sonic user experience and psychophysiology in a first-person shooter game
Lennart E. Nacke, Mark N. Grimshaw, Craig A. Lindley

The role of hedonic and utilitarian motivation in engaging user experiences
Heather Lynn O'Brien

Needs, affect, and interactive products – facets of user experience
Marc Hassenzahl, Sarah Diefenbach, Anja Göritz

Regular papers awaiting printed publication are as below. They can be accessed now via the Science Direct website, downloaded and referenced using the allocated doi.

The roles of conceptual device models and user goals in avoiding device initialization errors
Kimberley Hiltz, Jonathan Back, Ann Blandford

Third-party error detection support mechanisms for dictation speech recognition
Lina Zhou, Yongmei Shi, Andrew Sears

Revisiting breadth vs. depth in menu structures for blind users of screen readers
Harry Hochheiser, Jonathan Lazar

Visual search in dynamic 3D visualisations of unstructured picture collections
Olivier Christmann, Noëlle Carbonell, Simon Richir

The impact of progress indicators on task completion
Frederick G. Conrad, Mick P. Couper, Roger Tourangeau, Andy Peytchev

The effects of trust, security and privacy in social networking: A security-based approach to understand the pattern of adoption
Don Shin

Understanding user preferences based on usability and aesthetics before and after actual use
Sangwon Lee, Richard J Koubek

The next Special Issue, to be published as Volume 22, Issue 6, will be edited by Patrick Langdon and Harold Thimbleby and is on the topic of Inclusive Interaction. These papers are currently being revised and will appear as 'Papers in Press' on the journal website as they are accepted.

Future plans for 2011 include some exciting Special Issues. One, which attracted a great deal of attention and anticipation at the CHI 2010 conference, will be that edited by Elizabeth Churchill and Shaowen Bardzell on the topic of Feminist HCI, following on from Shaowen's well-received paper at the conference. This will be the first set of papers addressing this issue to be published in an HCI/CS journal and is likely to engender much debate and comment. The next Special Issue after that will be the specially invited and selected best full papers from the ECCE 2010 conference, with the issue being edited by Willem-Paul Brinkman and colleagues.

As ever, I am happy to receive any comments about the journal, new submissions, new registrations (especially of reviewers) and any proposals for Special Issues. I am especially keen to have BCS and Interaction group members submit papers to our group's

highly successful and influential journal. Please contact me in person by email (dianne@city.ac.uk) to discuss any papers you might like to submit to IwC.

In the next article I will report on the very well-attended Editorial Board meeting at the CHI conference in Atlanta, introduce our latest editorial Board members and discuss our revised policy on journal Special Issues. I also expect to be able to report the latest Impact Factor and a revised set of journal documentation and an updated aims and scope of the journal.

Access Interacting with Computers via the Science Direct link and see, on the IwC homepage, the latest papers, most downloaded articles, up-to-the minute citation statistics and calls for submissions.

Dianne Murray
General Editor, Interacting with Computers
http://ees.elsevier.com/iwc/
http://www.sciencedirect.com/science/journal/09535438

CfP

TEI 2011

Tangible, Embedded and Embodied Interaction

23–26 January 2011
Funchal, Madeira, Portugal

Submission deadlines

1 August 2010:   Papers, Studio and Workshop Proposals

17 October 2010: Explorations

31 October 2010: Workshop Papers

tei-conf.org/11

Available now – latest issue of the

International Journal of Mobile Human Computer Interaction (IJMHCI)

Guest edited by Janet C Read, Panos Markopoulos, and Allison Druin, this special issue focuses on children and their interactions with mobile technology and has contributions from some of the most recognised researchers in this area.

Editor-in-Chief: Joanna Lumsden, Aston University, UK

www.igi-global.com/ijmhci

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INTERACT 2011

13th IFIP TC13 Conference on Human–Computer Interaction

5–9 September 2011
Lisbon, Portugal

First submission deadlines

10 January 2011: Full Paper Abstracts

24 January 2011: Full Papers

21 March 2011: Tutorial Proposals, Workshop Proposals

7 April 2011:   Other

www.interact2011.org

CfP

Behaviour and Information Technology (BIT)

Special Issue on
Cognitive Modeling of Web Navigation

Editors: Bipin Indurkhya and Herre van Oostendorp

Submission deadline
1 September 2010

www.tandf.co.uk/journals/tf/0144929X.html

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