

# **Abstracts**

## Fun is in doing together

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### **Introduction**

This paper describes some of the field trial results from user research conducted at Helsinki University of Technology for the Esprit LTR project Maypole. The aim was to find out what the users do in their free time with their friends. The users were children between ages 8 and 12.

The goal of Maypole is to develop new and innovative user interfaces that support sharing activities in families and local communities. The other consortium partners are Nokia, IDEO, University of Vienna, Netherlands Design Institute and Meru research.

To gain data for design decisions about user's preferences, in2it devices and Nintendo Game Boy Cameras were given to children for trial use. in2it is a personal communicator for children developed by Philips Electronics. The in2it has a stylus and a touch screen and it can create messages, tunes and "passports" and send them via infrared. It also can match people's biorhythms and predict the love, think and physical aspects for a given day.

Nintendo Game Boy Camera takes pictures, and allows editing them with e.g. frames, text, sounds and hyperlinks and a number of filters. There are also three games. The pictures can be printed with the Printer onto stickers.

### **Field trials**

in2it devices were given to 5 siblings and one of their friends between ages 5 and 12 for almost one week to use in their own environment. After that a focus group session with the testers was held. The children were asked about in2it and their free-time activities. The focus was on the children's social activities, and on their experiences and opinions about in2iT. The results will be described in the paper.

The Game Boy Cameras were given to 3 girls age 9 and 4 boys ages between 8 and 13. Both girls and boys attended the focus group held after the field trial. The children showed the pictures they had taken, and what they had liked about the pictures, the editing and the device, and where they had used it. They were also asked to design their perfect device. The results will be described in the paper.

### **Conclusions**

The users liked using these devices together with their friends, classmates and family, the fun was in the group activity that focused on using these devices.

The field trial results described in the paper are consistent with the idea of a participatory design and research method called Reciprocal Evolution. The method suggests that use is design, that users tend to start using technology in a way it was not designed for, and observing existing technologies can give directions and insights for new technologies. This is perhaps even more valid in the case of leisure time than in work tasks, where the organizational framework supports social networking. The fun in in2its and Game Boy Cameras was in using them together with friends.

## Fun User Interface (FUI)

### Does User-Centered Design Work in Entertainment Imaging?

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The Systems Concepts Center (SCC) is a multi-disciplinary team dedicated to generating growth through identifying and demonstrating new value propositions, with a "technology neutral" systems perspective in partnership with the rest of the Kodak technical and business communities. Entertainment markets are the largest and fastest growing markets in the world, and account for more U.S. exports than any other industry. The Entertainment Markets team within the System Concepts Center builds on the natural affinity of imaging and entertainment; looking at images as entertainment and image making/manipulation as marketable "fun" services. The primary focus of the entertainment team is the development of new concepts which provide fun and entertaining ways for people to interact with images. Our work is comprised of two parts: (1) The identification of internal and external partners (such as NBA, TBS/Atlanta Braves, Universal Studios, Sega, and Paramount/VIACOM) and customers who can provide access to valuable content and/or retail channels. (2) The development of new solutions which leverage this image content.

The main theme behind entertainment concepts is to create **Kodak Entertainment Moments**, a truly "fun multi-sensory, multimedia experience" and provide users with a take-away that will allow users to be reminded of and share the experience after it is over. The opportunity targets for this team are location-based entertainment (LBE), travel and tourism, sports, motion picture / performing arts, and cultural / educational institutes. The team of talented business researchers, software engineers, graphic and interaction designers, and human factors engineers works together to build new concepts using user centered design principles. The usual steps included in the process are—a) work with partners within market situations to identify new customer wants or needs, b) define Kodak's opportunity in satisfying this need, c) identify product concepts that meet the need, d) develop the process or solution needed to produce such a product, e) prototype and test the solution internally and externally at different venues, f) refine using iterative design, and g) help to commercialize, if successful. The team has collaborated with Kodak Imagination Works which is part of Kodak's entertainment Imaging business unit to explore target entertainment markets, early concepting of solutions, and market evaluations.

This presentation will discuss the user-centered design methodology from early concept development to collecting voice-of-customer and voice-of-end-consumer on two recent projects - Cyber Artist and PSILY.

"Cyber Artist" is one of Kodak's explorations into the addition of entertainment venues within movie theater lobbies. The product consists of a camera, computer screen, software and printer. An individual or small group sits in front of a screen,

poses, and sees a drawing being sketched and colored by a "magic drawing pencil". While watching the drawing being created on the screen, a printer is simultaneously making a colored caricature print. Several types of backgrounds can be initially selected by the consumer. A large, separate, monitor allows on-lookers to view both the posing and the drawing of the portrait. The concepts not only entertains the participant but also engages on-lookers to provide a kind of community experience.

PSILY ("P.S. I Love You") is a personalized audio/portrait kiosk designed in collaboration with PSILY, California. This kiosk enables customers to communicate their feeling for their loved ones by creating a unique gift of personalized music. The concept allowed customers to create a Mother's day song on a CD or cassette tape personalized with information such mother's name, eye color, location, and gift giver's name. The PSILY kiosk concept combined PSILY's product with on-site customer image and personal voice capture.

## **Using Cognitive Models to Transfer the Strengths of Computer Games into Human Computer Interfaces**

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This paper extends techniques from affective psychology to show how cognitive models can be used to represent and reason about interaction with computer games. It is argued that this modelling activity provides insights into the motivational appeal that often distinguishes computer games from other forms of human computer interaction. The long-term aim behind this research is to use our improved understanding of interaction with computer games to inform the subsequent development of more general classes of interactive systems. Barnard's Interacting Cognitive Subsystems (ICS) is used throughout this paper. This decision is justified by the fact that ICS has already been applied to analyze the negative emotions surrounding clinical depression. This previous work provides a useful starting point for our investigation of the more positive emotions evoked during interaction with computer games. A further justification is that ICS has also been successfully used to represent and reason about the design of human computer interfaces.

Keywords: computer games; user modelling; fun; human computer interaction.

**Playfulness, persistence and computer use:**  
**a study of individual differences**

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During the 1980's there was a considerable body of literature investigating anxiety or fear about computers (sometimes referred to as "computerphobia"). Rosen and Maguire (1990), in a meta-analysis of 81 studies, found that approximately 25% of all people feel less than completely comfortable with computers. Numerous instruments were also developed to measure computer anxiety, although none has become the standard measure. The relationship between computer anxiety and individual variables such as age, education, sex and various personality characteristics was explored. At the other end of the spectrum, research also addressed individual differences which might lead to computer "addiction" or dependency (Shotton, 1989). Perhaps because of this emphasis on the negative aspects of attitudes towards and use of computers, little research has addressed the more positive aspects of this domain. What kinds of individuals enjoy using computers, find them fruitful in their work or leisure and are "good" with computers? Some research has suggested that having a "playful" attitude to computers is very beneficial (Starbuck and Webster, 1991): regarding the computer as an artefact with which to play, a game, or a puzzle or problem to be solved, in either leisure or work contexts. Our own observations suggest that another relevant aspect of attitudes towards and use of computers, is a sense of persistence. Current personal computer systems, whether PCs or Apples, often do not do exactly what the user wants or expects the first time a task is attempted. However, individuals who seem to enjoy using computers most and are the most proficient at using them, are those who persist in trying to achieve a particular task, exploring different ways the computer might allow them to achieve it, until they find a solution.

To investigate the relationship between the two variables of playfulness and persistence (which may in fact be inter-related) and attitudes towards computers, an exploratory study using paper and pencil measures of the variables of interest was conducted. This study is being followed up with a further study in which actual behaviour while using computers is observed; this will be used to supplement and validate the paper and pencil measures. 167 participants (university students and employees from a number of local firms) completed the following scales: the Computer Playfulness Scale (Webster and Martocchio, 1992); the Computer Attitudes Scale (CAS) (Nickell and Pinto, 1986); the Computer Anxiety Rating Scale (CARS) (Heinssen, Glass and Knight, 1987); the Computer Self-Efficacy Scale (CSE) (Murphy, Coover and Owen, 1989); the Locus of Control Scale, used to measure internal-external locus of control; the Group Embedded Figures Test, used to measure field independence-dependence; the Adjective Check List (ACL), a general personality inventory, used particularly to assess participants' perception of their creativity; the Raven's Advanced Matrices test of general ability; the Persistence Inventory (a 12 item Likert scale measure developed by the authors); and a questionnaire to obtain demographic information and data about use of computers. A multivariate linear regression analysis revealed that participants' scores on the Computer Playfulness Scale could be strongly predicted from their scores on the

three computer attitude and anxiety scales (the CSE, CARS and CAS), from a set of questions relating to persistence in computer use (but not the general Persistence Inventory), from one subscale of the ACL reflecting a need to seek novelty of experience and avoid routine and from the participants' sex. The implications of these and other findings will be discussed.

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## Introducing The "Virtual Theatre" Immersive Drama Project

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Cambridge University has recently launched a new Centre for Communications Systems Research, (CCSR), aimed at establishing a world class R & D laboratory, focusing on far-reaching explorations of future media and communications technologies. This autumn, we are initiating a cross-disciplinary research project which is built around the concept of developing a new media form, one based on first-person, direct participation within improvised drama.

The technologies needed to create this new media experience are fast becoming available. Developments in such areas as telepresence, real-time computer imaging and advanced network capabilities are all progressing rapidly. What has traditionally been lacking is a clear overall vision of how all of this diverse technological momentum might be successfully harnessed by the creative community itself, in order to achieve the true paradigm breakthrough that 'convergence' has been anticipating for some time now. We intend to exploit these technological developments to devise new systems that will directly empower individuals, allowing them to make use of their own innate creativity by casting them in active roles within unique dramatic works.

Through such a system, everything from drama through education could potentially be transformed.

This project is founded upon the vision of a future "many to many" media landscape, characterised by real-time generation of interactive experiences, experiences that the end users themselves have as much of a hand in shaping as do professional production companies. As with the early days of the moving image industry, a new entertainment form, the computer game, is already being explored along the fringes of mainstream culture, in the video games arcades and through millions of PCs and domestic games consoles. The only area of our modern media society that has grown faster or bigger is of course the Internet itself -also fundamentally characterised by its ability to directly empower the end user.

Within these new forms there is one overriding common denominator- It is not about watching, it is about doing.

Our concept for this new form of media experience is based upon three fundamental principals-

- 1- Real Time 3d Engines and other forms of dynamic content generation are potentially as significant a breakthrough as any that has come before, and consequently, could eventually be hailed as "The sprocket holes of the 21st century".
- 2- The increasing availability of fast, wide and multi-directional networks leads to real individual empowerment, and consequently, is giving rise to the ultimate media paradigm shift - "Users as creators of content".
- 3- Anonymity, which is widely recognised as being 'The wine of the Internet', is the social lubricant that awakens both the communicative and the creative potential. This gives rise to what might be called "The Karaoke factor"- the potential within all of us to relax into the fun of the moment, to enter into a state of 'social play' when presented with the right 'safe' context.



These factors, when tied together with our fundamental affinity for storytelling and drama, an affinity that goes to the very heart of our psychological makeup, present a very compelling combination. One that we feel holds the key to unlocking the full potential of future media experiences.

As well as seeking to advance a new concept of what an entertainment or educational experience can be, we expect that this Immersive Drama project will also lead to the development of a whole new generation of technology.

Technologies which will allow real voices, gestures, emotions and spontaneous actions to become the primary means of interacting with computers and telecommunications networks.

And, more importantly, of projecting one's actions through such networks, to others around the world.

## User Engagement and Interactive Drama

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Is drama "fun"? The question arose during a recent visit to the cinema to see Steven Spielberg's "Saving Private Ryan". Some unimaginably harrowing and disturbing scenes of mutilation and human despair unfolded, far larger than life, before the audience. Was there a rush for the exits? On the contrary, most people could be seen contentedly munching popcorn. Yes, if fun is something you have with popcorn, then drama is fun. The essential purpose of drama whether it is theatre, film or television, is to evoke subjective experience in its audience. The advent of interactive digital television opens up many new possibilities for the structure and presentation of drama and the way in which people may engage with it. However, the design of interactive, computer-based environments requires theoretical and practical bases which are largely new to the dramatic arts. This paper describes research which is exploring the convergence of ideas and design models from a range of traditional sources including HCI, psychology, the performing arts and media production for this new media form. It starts by reevaluating two traditional dramatic paradigms. The first and most familiar of these is Stanislavsky's Realism in which the aim of drama is for the audience to suspend its disbelief and to regard the play as reality. The second, Brecht's Objectivity, aims for the audience to witness theatre in a state of sentient objectivity, to think about the issues portrayed and to have their minds opened to new perspectives. It goes on to consider the possibilities which may be offered by Boal's Spect-actor paradigm in which members of the audience take part in the drama so that their involvement transcends catharsis and becomes wholly enacted in a process which Boal calls "dynamisation". Although existing technology cannot enable a faithful computer based implementation of the spect-actor paradigm, the model may be approachable in various ways and thus provides a useful goal for designers. The realities of designing and producing interactive drama are illustrated with practical examples. Different ways in which the user can go more deeply into the drama, for example by sampling characters' thoughts and viewpoints are shown and discussed not only from the perspective of drama production but also in terms of the new affordances which they bring to human interactions with computers. Finally, workshop delegates are invited to participate in the evaluation of the design models which have been developed via a website.

## **Animation, the fun factor and memory**

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The addition of graphics to a text can do many things, including modifying the fun factor. This is most likely to be the case when the graphics are being used for emphasis and embellishment rather than explanation. Data from three series of studies involving graphics used for these purposes will be discussed. These investigations involved widely different materials, tasks and content domains. The first study addressed the issue of whether graphics added enjoyment to reading, the second and third studies examined the effects of animating the graphics in online texts.

Graphics differ in style and in their spatial and semantic linking to the text. The effects of these factors were contrasted in the first study with texts from the domains of back pain and heart disease. People read the information in counterbalanced orders and then completed rating scales assessing the effects of the graphics. Although most people preferred the texts with graphics to those without, i.e. the graphics made the text more enjoyable, the magnitude of the effects were greater for cartoon graphics in the heart disease text than for realistic line drawings in the back pain text. So this study shows that although graphics can, they do not necessarily enhance the fun factor.

The effects of animating cartoon graphics were explored using interactive texts dealing with rheumatoid arthritis, explaining both the nature of the illness and its treatment. The graphics sought to emphasise main points from the text by re-expressing these as the behaviour of a cartoon dragon living in the diseased joints. When silent depictions of the dragon were animated, this increased people's willingness to look at the graphics during the course of reading. Since the animation added no new information, this change in behaviour would seem to reflect the enjoyment people derived from watching the animations - i.e. the fun factor. An auditory commentary increased people's willingness to view both animated and non-animated graphics. (Does sound potentiate the fun?) Nevertheless, even when there was an auditory commentary people were more likely to view animated than static graphics.

The third series of experiments examined whether the effects of animation were specific to the locus of their integration with verbal text. Using several short interactive narratives describing British castles and villages, the effects of static and animated graphics were assessed by contrasting the performance of readers who viewed the graphics during reading or only before/after reading. When animated graphics were watched during reading, this increased the time spent reading the text itself but these people had poorer memory for the content than did those who viewed the animations before studying the text. These findings suggest that people may find viewing animated graphics to be fun, but having fun may not always be beneficial to other cognitive activities.

### **Acknowledgement**

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permission to convert a splendid video they had made about rheumatoid arthritis into the interactive texts used in the second study reported here.

## From Task-Based to Fun-Based Design: Evaluation of Navigational Tools

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Navigation in information spaces is a cognitively demanding activity, which sometimes make us feel frustrated or anxious. We get lost, we do not find what we wanted, we are exposed to technical problems where files are not found, we wander in circles, and we sometimes get so frustrated so that we give up. Furthermore, there are large individual differences (partly due to our spatial ability [Dahlbäck et al., 1996]) that point at huge differences in how well different groups of users are at navigating information spaces. It seems obvious that we need to find new approaches to design.

We are exploring a couple of ideas where we rely much more on inducing a sense of relaxed relationship and social aspects to the navigation in the information space. One such idea is...

### **Agneta & Frida...**

On the user's personal desktop are placed two animated females (mother and daughter), sitting in their living-room chairs, watching the browser (more or less like watching television). The behaviours of the characters are triggered by document content (text, imagery, sound files, error messages, browser malfunctions etc.), user's activity (on-load, on-click, on mouse-over) and a randomised set of behaviours popping up now and then by themselves (coughing, drinking coffee, getting coffee in the kitchen, going to the toilet, gossiping about neighbour, etc). In addition, the user has the option to have a plotline running in parallel, intermingling with the others (in the demo a drama and a comedy).

In contrast to usual agents Agneta and Frida are not serious and polite guides that are part of the interface, but often distance themselves from computer culture in general and its male dominance in particular. Humour and irony are crucial elements here. Also AGNETA & FRIDA tries to bring together browsing and narrative experience into one mode.

We are currently designing a user study on the AGNETA & FRIDA system where we aim to explore some of the more "soft" features of navigation. Our study will not be fixed on how well users perform the tasks that they face in terms of time spent, number of errors made, or any of the "old" usability measures. In fact, in a system like AGNETA & FRIDA more time spent might be a measure of success since it would mean that they find the space interesting enough to stay in. Even more important are perhaps long-term measurements of how often they return to AGNETA & FRIDA to hear new jokes. Therefore, we are going to study whether a system such as AGNETA & FRIDA:

- encourages exploration (as opposed to wayfinding [Benyon and Höök, 1997])
- creates a "delightful" experience, rather than making users anxious about getting lost. Here we are not only interested in whether they enjoy Agneta & Frida but also if they are annoyed by them, or other emotional reactions to these characters

- creates “anthropomorphic” expectations, to what extent the users have expectations of “human like” behaviour from the characters and “human like” emotions within the characters; and if these expectation vary with different intensity in the appearance of the characters.
- creates a different perspective on what navigation is - a shift from navigation in a spatial space (as users perceive the web [Maglio and Matlock, 1998]) to experiencing a mixture of an interactive narrative and a hypermedia navigation [Murray, 1997].

The problem is how to measure these aspects, and whether measurements in some objective meaning are of any real use. Our current plan is to perform an evaluation of Agneta & Frida where the users facial expressions will be recorded on video and analysed in relation to the interaction with the computer and with the characters' actions on the screen. We will also analyse the users' language when talking about or describing the system. The over all subjective impression of using the system will be captured in a questionnaire.

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