"Catma", Foolishness and Intuition: Experience Designed?

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Abstract

In this paper I discuss how interaction aesthetics are important when designing experiences with virtual reality (VR) and multimedia. The interaction aesthetic appeal should include the response, control, reflection and belonging. These are important when creating physical, intellectual, emotional and/or spiritual experiences using interactive multimedia and VR technologies. Swimming Across the Pacific and the Iamascope illustrate how these elements contribute design techniques for creating these experiences.

Introduction

Over the years, I have created several types of "experiences" for people to have; some using technologies, others not. Experience tends to be thought of as the opposite of dogma, logic and reasoning which require thought without action hence the terms, "catma, foolishness and intuition". Experience comes from experimentation with the world to learn from doing. This had led me to consider some of the difficult questions I have with understanding what the elusive sense of an experience is and how to design for it using technology. On one hand, anything that people try or experiment with leads to an experience. On the other hand, not all experiences are equal. Perhaps, more specifically I have been trying to create *memorable* or *life altering* experiences for people through interaction. The belief is that through these experiences, people will see the world differently leading to an enrichment of their lives. These experiences cannot be learned by reading or asking someone, rather, they require the person to participate in the activity, even if they just stand there and watch.

Virtual reality (VR) and multimedia systems attempt to provide new experiences for people. However, in general, VR has not lived up to its promise of providing rich experiences for people with out having to experience the actual world being simulated Likewise, multimedia systems have not proved so successful as hoped and have continue to be an entertainment vehicle with a mostly a passive linear narrative. However, what does seem to be successful lately are communication media such as blogs, podcasts, shared tagging systems, text messaging etc. These are ways to communicate experience rather then having the experience itself (though it may be a form of reliving the experience). With respect to experience, what can we learn from these developments?

One of the starting points is to consider what types of experiences there are that we are trying to create using technology. There are four main types of experiences: intellectual, physical, emotional and spiritual. For the most part, interacting with computers has been at the intellectual level. However, VR tends to also include a physical experience and multimedia content tends to include an emotional experience. Interactive artworks such as Davies' Osmose [Davies, 1995], often try to incorporate

physical, emotional and intellectual experiences with the occasional appeal to the spiritual as in Gaver's design concept of the Prayer Device [Gaver, 2003].
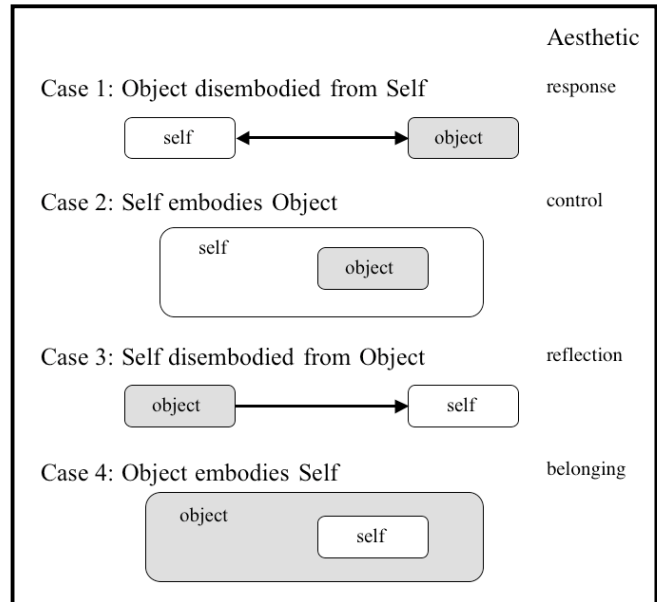
What is interesting, is that considerable success has been found with interactive artworks that directly appeal to the physical, emotional and intellectual as far as creating memorable experiences. Unfortunately, this has also been true in a negative sense from typical application design, such as Microsoft word, that end up being hard to use so are frustrating and can also cause physical injury leading to very long term negative experience. I believe that appealing to each of the three types of experience and possibly the forth is the direction of VR and multimedia design for enhancing the user experience with these technologies.

In everyday life, the ability to successfully navigate the challenges and stresses of life by being fully in control and continually expanding one's experience

Figure 1: Four types of relationship between a person and an object including aesthetics. The relationship types are not mutually exclusive and may be happening simultaneously at varying degrees.

through action has been described by Csikszentmihalyi [Csikszentmihalyi, 1990] as necessary to experience a "Flow" phenomena. This sense of flow is what makes life satisfying and allows people to build on there experiences and integrate them into their lives. The consequences of being in "flow" are very positive and provide a life-time of increasingly complex experiences. In my work on designing for intimacy [Fels, 2005], I argue that to design technologies that support a "flow" experience four aesthetic appeals are necessary: response, control, reflection and belonging as shown in figure 1. Attention to the heart, body and mind are important to address these aesthetics.

The following three works discuss some of the type of experiences that I have created and how the different appeals have been addressed. The last one, while not technical, illustrates how different techniques can be used to appeal to people's sensitivities to create deep, meaningful experiences.

Swimming Across the Pacific

Swimming across the Pacific (SAP) [Fels, 2005] is an exhibit based on a locomotion interface for swimming in a virtual reality ocean environment. In SAP we suspend the swimmer using a hand gliding and leg harness with pulleys and ropes in an 8ft-cubic swimming apparatus as shown in figure 2. The virtual reality ocean world has sky, sea waves, splashes, ocean floor and an avatar representing the swimmer who wears a tracked head-mounted display so he can watch himself swim in a bird's eye view, as well as watch the world from a first-person perspective as in typical VR. The audience sees the swimmer hanging in the apparatus overlaid on a video projection of his ocean swimming avatar. The

avatar mimics the real swimmer's movements sensed by eight magnetic position trackers attached to the swimmer.

This piece attempts to give participants an experience of swimming with out being in the water. The interface is considered a locomotive interface [Christianson et al, 2000 and Durlach and Mavor, 1994] in that participants must expend physical effort to move in the work. Locomotive interfaces tend provide strong physical experiences due to their energy extractive nature and SAP is no different.

Figure 2: Swimmer in swimming apparatus.

From our observation of people in the work at Siggraph04 and Imagina'05 we noticed that people came away with a good impression and a unique, fun experience. Many people wrote in the questionnaires, "It was GREAT!" While people found it difficult to articulate in the questionnaires, they almost all had a lot of fun and felt that they had experienced something interesting.

Of interest with respect to designing the experience in a VR world, we made some choices that led to people's strong experience with the work. Our design did not try to simulate the real-world accurately as we had limited resources and it was not the intent. We wanted to have people experience the artwork of SAP and feel part of a swimming team effort to cross the Pacific ocean with others who also swan on a particular day. We did place attention on the comfort of the participant while being suspended and the resistance feedback to the participants legs and body to feel like they were floating in water as they swam. Also, we focus the setting of the piece to make people identify with the experience they were about to have, that is of "swimming across the Pacific Ocean". We did this by having attendants at each installation guide each participant through donning and doffing the gear and making the piece coherent in it visual aesthetic.

Overall, the piece was quite successful in generating a fun, meaningful experience for participants. The look of the piece was intriguing and stimulated people's curiosity to try it. The attendants provided context for people to experiment and the piece itself allowed people to physically engage in the work. The use of the 3rd person in the HMD allowed people to reflect on what they were doing to stimulate their intellectual sense of the piece. This is in addition to the artistic context that they were told about. The design incorporates all four of the interaction aesthetics. The responsiveness of the system once people are swimming easily provides them a sense of movement in the water. The use of swimming actions that are familiar to people provided a very fast way to feel they have embodied the interface and can control their movement and navigation in the VR world without having to thing about. We designed an attractive swimming apparatus, provided attendants with nicely designed SAP uniforms and made the VR world interesting visually to attract people to try provided a visual reflection aesthetic. Finally, we framed the experience in terms of belonging to a team of people trying to swim across the Pacific Ocean including providing a swimming badge afterwards to give a sense of belonging. The complete experience from the initial curiosity to the final departing from the SAP work was orchestrated to facilitate imparting a strong experience. From our observations and studies, we are confident that we were mostly successful. Hence, SAP demonstrates some design elements needed for using VR to provide a physical and intellectual experience that can affect people's lives.

Iamascope

The *Iamascope* is an interactive, electronic kaleidoscope that combines computer, video, graphics and audio technology for participants to create striking imagery and sound [Fels and Mase, 1999]. In the installation, the players take the place of a colorful piece of floating glass inside a kaleidoscope, and simultaneously view a kaleidoscopic image of themselves on a large screen in real time. The *Iamascope* uses a single video camera as input at the base of the projection screen. Anything or anyone in front of the camera is captured and turned into a large kaleidoscopic image using multiple reflections of a small extract of the video image such as shown in figure 3. By applying image processing to the

Figure 3: Player inside the Iamascope.

multicolored visuals, participants' body movements directly control music in parallel with changes to the image. The responsive nature of the whole system allows users to have an intimate, engaging, satisfying multimedia experience.

Participants in the Iamascope have several levels of aesthetic experience arising from the different types of relationships that form inside it. Interestingly, the participant controls two different aspects of the experience: music and imagery. The musical control part of Iamascope demonstrates the difficulties with easy-to-use approaches to musical interfaces. However, the imagery control demonstrates how the use of "mirrors" provide effective design strategies. At first, the participant typically does not appreciate the influence he has on the imagery and spends time moving his body to see what effect it has. The responding images and music at this time are generally pleasing and give the participant a good feeling, however, the participant does not associate it very well with his movement. This level of intimacy occurs in the first type of relationship where the effect provides the emotional response. As well, as the images are essentially a kaleidoscope, it has the same reflective aesthetic appeal as a normal, mirror based kaleidoscope.

With practice in the Iamascope, the participant finds that he can precisely control the image that he produces. This exploration is possible due to the highly responsive nature of the video images. This process stimulates the increase of intimacy with the device. Soon, he becomes unaware of the machine and moves as if the images are direct extensions of himself. At this point, he has embodied the Iamascope and feels satisfaction just from moving in it. The Iamascope also supports the belonging aesthetic when the participant feels they are moving to the image itself. This has been reported by a number of participants and is especially noticeable when the sound source is from pre-recorded music rather than from the interactive component.

The interaction space in front of the projection screen is large enough for two to four people. When used collaboratively, players equally tend to either stand side-by-side or one in front of the other. The kaleidoscopic array shows the images created by all the players, resulting in everyone's attention being directed to the projection screen. People generally experience the image in two modes; either they see the whole image as a Gestalt image due to the symmetry, or they focus in on the small piece of the kaleidoscope that corresponds to the image taken by the video camera and ignore the rest of the reflected whole. Players can easily switch attention to see what the other players are doing, while at the same time perceive the overall effect. This capacity strongly supports a collaborative experience for everyone,

although the focus tends to be more visual than aural. Complete strangers have been observed dancing together in the Iamascope.

The Iamascope provides a very strong experience for many people in a very short time of using it. I believe it is because it appeals to all the aesthetics of interaction and uses a physical engagement with a video process that emulates a special type of mirror to generate a physical experience. Participants have enjoyed it to the point of coming to tears providing an emotional experience. Thus, as a multimedia experience the design choices suggests some important properties for creating new experiences. Specifically, the use of a mirror.

The Iamascope uses a conceptual mirror to provide a means of identification for the player. The player can easily change focus from the macro image of the kaleidoscope to the micro image of his own image. The abstraction is sufficient so that players are not self-conscious. However, it is concrete enough so that a player can see himself if desired. This property makes for quick development of intimacy and embodiment with the device. The visual imagery, being a mirror of the actual person continues to provide complexity in the image as players became experts. However, the musical mapping quickly reaches its limits of expression.

Mirrors, whether virtual, real or conceptual, provide an effective means for developing intimacy with devices. They have been successfully used in such works as the Wooden Mirror [Rozin 1999] and Eliza [Weizenbaum, 1966]. However, they have limits for expression depending upon the context. The main difficulty is that there is a delicate balance required in the degree of reflection and abstraction. If the mapping it too direct, users may become self-conscious (such as in a public installation) or it doesn't allow significant benefit over what the player would do himself directly. If the mapping is too abstract or indirect to provide new functions (i.e., through some computer support algorithm), the player may not recognize himself and the advantages of mirrors are lost.

Summary

Experience requires participation and action. Designing experiences requires attention to the types of interactions and the aesthetics of those interaction. I argue that four types of aesthetic appeals should be included when designing new experiences for VR and multimedia systems. Furthermore, the designs should appeal to at least two of the four types of experience to enhance the overall strength of it. The types include physical, intellectual, emotional and spiritual. VR and multimedia are at the cusp of a new depth where we go beyond the literal interpretation of these spaces and types of information spaces and look at what people are feeling in them and what they can do in them. I suggest that the conceptual mirror is one approach to achieving strong experiences, however, there a many other ways that have yet to be explored. The future is bright for discovering the role that technology can play in creating new types of human experiences to change the way people and society view themselves and each other.

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