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INTERACTIVE INSTALLATIONS FOR THE MIND AND BODY

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"My Fingers Getting Tired: Unencumbered Interactive Installations for the Entire Body

INTRODUCTION

The perspective of this paper is that the experience of interactive art can be an aesthetically pleasing experience for the mind and also for the body. This goal can be obtained when the human manipulation of an interactive system becomes physically enjoyable and conceptually relevant.

Pertaining to the aesthetic experience of interactive art is the social environment which contains the experience. Art forms are typically experienced by groups of people within galleries, museums and theaters. The popularity of the group based aesthetic experience is due to humans being social creatures who need and apparently enjoy interacting with each other. In contrast, users of the World Wide Web and of CD-ROM's usually undertake solitary interactive experiences.

The remainder of this paper will expand on the unencumbered interface for the entire body, interactivity as content, and simultaneous interactivity for multiple users.

PHYSICAL AESTHETICS

Although the experience of screen based interactive art may be satisfying intellectually and aesthetically, the physical experience of small hand motions while depressing an index finger on a computer mouse is physically similar whether one is using tax return software or viewing an artistic CD-ROM. If interactive art will become an influential and cultural medium, the entire body--and not just the index finger--should be involved in the interactive experience.

While the contemporary topic of aesthetics has developed over thousands of years of writings, the perspective of the established field of aesthetics may not be appropriate when dealing with interactive art. While aesthetic discussions usually deal with the artistic experience of a passive audience, this paper considers an aesthetic experience from the perspective of an active audience, one who participates interactively with the entire body, hands, arms, and legs. Consideration should be given to these body parts because a human typically indicates decisions with physical movements or gestures when using interactive media.

The measure "Physical Aesthetics" has been created to rate the quality of a physical experience when using an interactive medium. This measure indicates the level of pleasantness within a physical experience by using an increasing positive number, and the level of unpleasantness with an increasing negative number. Most people, for example, would probably prefer the physical act of riding a bicycle to the physical act of making small wrist motions with a computer mouse; bicycling riding, therefore, would get a higher Physical Aesthetics score. Although no empirical testing has been performed on this proposed measure, the following results might be obtained for some popular physical activities:

ACTIVITY:	PAPS:
falling down stairs	-68
dropping radio on toe	-30
tapping the index finger	3
sitting in a chair	8
walking	14
swimming	27
riding a bicycle	28
having sex	68

THE ENCUMBERED EXPERIENCE

Other than 3D cinema, which requires viewers to wear special glasses, the experience of art does not typically require the attachment of devices onto a viewer. One walks into a gallery and simply views paintings, or sits in a chair to watch a film. The experience of interactive art through the use of a physical device, such as a data glove or a mouse, can be inconvenient and frustrating to users who unfamiliar with the proper use.

The popular computer mouse is a low cost standardized input device that has been designed to accommodate the designs of hardware and software manufacturers. As mentioned in the previous section, the physical experience of operating a mouse is not very pleasant, yet most of us have spent thousands of hours torturing our wrists and index finger by using this device.

The use of a computer mouse, however, is very convenient for some tasks, such as pointing to a word or entering numbers in a spread sheet program. These tasks themselves would not be classified as aesthetic experiences, so the use of a mouse is not necessarily a problem in these situations. Most people who create media with popular graphics and sound software are using computers equipped with a mouse as the input device, tasks which seem appropriate for a mouse interface.

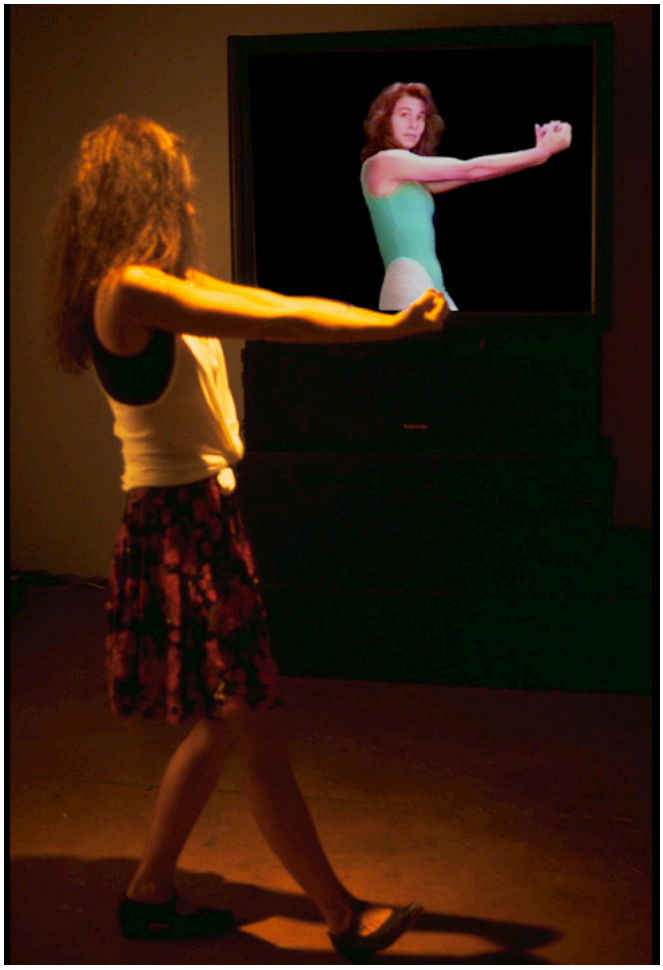
When experiencing interactive art as a cultural medium, however, the supposed goal is to create an overall aesthetic experience. The use of any encumbered device, such as a mouse, can detract from this experience because the physical motions required by an encumbered input device rarely provide a pleasant physical experience.

Exhibiting interactive works which require a physical input device has other problems in addition to aesthetic concerns. Because it is a physical device, access to an interactive work is often limited by the quantity of available input devices. Within an exhibition, one mouse driven computer can support only one user at a time, usually resulting in anxious lineups of viewers.

INTERACTIVITY FOR THE ENTIRE BODY

In the interactive video-sound installation "Fit" (1993), viewers use their entire body to interact with a video projection of an aerobics instructor. The aerobics instructor stands in silence while being viewed from a distance. When a viewer approaches, music begins and the instructor begins exercising. If a viewer stops to observe the image, the instructor also stops exercising and the music will cease. Each time the viewer moves his or her body, the aerobics instructor begins a new exercise in synchronization with music, such as stride jumps, arm exercises and knee bends. If a viewer moves or exercises nonstop, the tempo of the music will increase over time accompanied with faster routines by the instructor. If a viewer exercises for 30 seconds nonstop, the instructor

and music are presented at a dizzying rate. Within "Fit," viewers have opportunity to use their entire body during the interactive experience without the use of an encumbered input device.



FIT

INTERACTIVITY AS CONTENT

Most people are accustomed to light switches, water faucets, stove controls and other modern devices which provide light, water and heat in response to physical gestures. Many interactive computer based works incorporate designs that are functionally similar to light switches: a button is pressed and a light turns on, the mouse is clicked and an image is displayed. Although this capability provides a convenience when coordinating events over time, the physical gestures expressed by viewers are not conceptually related to the responses. Moving a mouse to a certain

position and pressing the button can provide millions of different images, text or sound as determined by the programming.

This approach to the creation of interactive experience does not incorporate a meaningful relationship between the physical gesture and the interactive response. The experience of interactive media may be more satisfying aesthetically if a conceptual relationship exists between the human gesture and the interactive response: interactivity can be used as content.

In the interactive video-sound installation "TV Guides" (1995), viewers encounter a living room environment containing a television. The television plays live programs which are heard and displayed on the television's screen. The imagery on the television is overlaid with cross hairs within a circle, giving the impression that the programs and the viewer are separated by a type of viewing scope. In response to any form of movement by the viewers, the television sound fades out and the cross hairs recede into a small circle, followed by text on the screen which requests viewers to remain still. The television imagery and sound will resume only after all viewers within the installation have remained motionless for at least 5 seconds. Each time the sound and image of the television is switched off in response to viewers' movements, a slightly different text message is provided on the screen of the television, such as "Please Remain Still," "Be Calm," or "Just Relax."

TV Guides

This installation demonstrates how interactivity can be used as content in addition to a technical component within an interactive work. Through its interactive response, "TV Guides" alludes to television being a medium which controls its viewers. Unless viewers remain completely passive and motionless while seated in front of the television, they will not receive their reward of programs and advertisements. Even when viewers attempt some form of independence and make a physical motion, the television attempts control by instructing them to "Please Remain Still."

MULTIPLE USERS SIMULTANEOUSLY

In addition to the artistic experience that is provided by museums, theaters and galleries, these institutions usually offer rich social experiences to the attendees. "Man is by nature a social animal." (Politics, 328 BC). Because humans enjoy and apparently prefer group experiences--especially during cultural events--it seems appropriate that exhibitions of interactive art within museums and galleries should provide simultaneous interactive experiences to groups rather than the more common single user.

In the interactive sound installation "Intersection" (1993) viewers encounter the sounds of speeding cars traveling across a completely dark exhibition space (35x50 ft, 10x17m). The illusion of traffic is created using various car sounds which are played through four pairs of stereo speakers placed at either end of four invisible lanes. As visitors walk through the installation, their presence in front of an approaching car will cause it to "screech" to a halt and remain "stopped" with its engine idling, while traffic continues in the other lanes. When a visitor leaves a lane containing a "stopped" car, this car quickly accelerates across the space. If a visitor remains standing in a lane with a "stopped" car, subsequent cars traveling down that lane will "smash" into the stopped car. Like an actual freeway, "safe areas" exist between each lane where a visitor may stand without affecting the flow of traffic.

"Intersection" was purposely designed to accommodate a large number of people simultaneously. Although a single computer controls the installation, each lane is an isolated system and operates independently of the other lanes. As multiple visitors enter the installations, the overall audio environment will contain sounds of cars accelerating, screeching, idling, and smashing into each other, typically combined with the gasps and occasional screams of the visitors. The installation can accommodate and operate with hundreds of visitors simultaneously, without any person using a physical input device.

Intersection

MULTIPLE USERS AS CONTENT

The accommodation of many viewers simultaneously by an interactive work is an efficient use of technology and provides a social environment for viewers. In addition to technical advantages, this form of design also provides the potential of using the multiple-user design as an element with the content.

In the interactive video-sound installation "Skies" (1998), people experience cooperation between themselves and cooperation with nature. Viewers encounter a 17x17m (50x50 ft) room and walk onto a video image (7x5m, 20x15 ft) projected onto a floor. As they walk on the video projection black paths are discovered and appear at specific locations. The installation can accommodate an unlimited number of visitors simultaneously, although at least five people are required to activate all the paths at one time.

Skies

As viewers locate the different paths within the installation, "Skies" presents video sequences and sounds according to the specific paths being discovered. When no paths are active, the video imagery is a night sky. The discovery of any one of the five paths will cause the presentation of sky sequences, including lightning with the sounds of thunder. When two paths are discovered the imagery provides 1 of 10 different video sequences containing water imagery, depending on the specific pair of paths discovered. Sequences containing the meeting of water with land--such as lily pads on water--are presented when three paths are discovered. The presentation of four paths provides land imagery, and five paths cause a dream-like sequence of the sun breaking through clouds.

Thirty-two different video sequences and sound tracks are contained within the installation, their selection determined by the specific combination of paths being displayed. When all five paths are discovered through the cooperation of 5 different participants, viewers discover that the paths form a 5-pointed star, a ubiquitous symbol from ancient years which currently appears in 48 national flags, including those of capitalistic and communistic countries. The 5-pointed star symbolizes various contrasting concepts, including the birth of Christ, black magic, good and evil. The ancient symbol of wisdom, power and protection while crossing time, cultural and political borders, the 5-pointed star is universally acknowledged throughout the 5 continents.

The interactive component of this installation was designed to be meaningful because the viewers--possibly strangers to each other--have to cooperate with each other in order to experience the entire work. When this work has been exhibited, viewers spoke to each other as they attempted to discover all the levels and sequences of imagery. Their cooperation with the nature imagery--as detected by the interactive system--is the intended content of the work.

"Skies" also demonstrates the other concerns expressed in this paper: unencumbered interactivity, the whole body participating in the interactive experience, multiple users accommodated simultaneously, and interactivity as content.

CROWD CONTROL

The last installation to be discussed is "Crowd Control," a work in progress. Unlike the previously discussed installations, the interactive component of the work is designed for a single user. This aspect of the installation, however, has been incorporated for a conceptual rather than a technical reason.

Visitors to "Crowd Control" enter a 6x12m (20x40 ft) room and encounter three large video projections. Video imagery on the side walls consists of large urban buildings, and the back wall contains a crowd of people. When a visitor enters the room, the crowd chants "speech, speech" and they encourage the visitor towards a podium located at the other end of the room. Visitors entering the installation can approach the podium, stand anywhere in the space, or sit on benches located against the side walls.

Visitors who walk onto the podium will encounter a lectern with a microphone and a teleprompter which contains a speech. If a visitor begins speaking through the microphone, the speech begins scrolling on the teleprompter and the video projected crowd becomes increasingly excited and supportive of the person speaking. If the visitor stops speaking, the scrolling speech pauses while the video projected crowd returns to the “speech, speech” chanting. The text presented on the teleprompter are actual excerpts from speeches by John F. Kennedy, Martin Luther King, Jr. and Adolf Hitler. Over 5000 lines of speeches are interactively available through the teleprompter.

When a visitor speaks into the microphone above a certain volume level and beyond a certain duration, the speech on the teleprompter scrolls faster, the enthusiasm of the crowd peaks, the video buildings shake violently with rumbling sounds, and the benches physically shake.

Crowd Control

Most people's lives are limited and ultimately controlled by various modern bureaucracies, including governments, employers, service providers and manufacturers. Crowd Control presents a unique opportunity for any individual to be momentarily endowed with leadership before an unquestioning and obedient crowd. The technical control that a visitor has over the activity of the video crowd, buildings, benches and teleprompter is a reflection of the intended content of the work: the human desire to control people and the environment.

CONCLUSION

Although the experience of screen based interactive art may be intellectually satisfying, the physical experience of mouse clicking is not a satisfying physical experience. If interactive art is going to become an influential and cultural medium, the entire body and mind should be involved in the interactive and aesthetic experience. This can be accomplished by using human interfaces which require participation by the entire body, and by using interfaces which are conceptually related to a project's content.