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The Intersection of Art and Interactivity
Don Ritter

"I sometimes think, Harry, that there are only two eras of importance in the world's history. The first is the appearance of a new medium for art …"
[Oscar Wilde, 1890]

Many artists are switching from traditional media into various digital media which provide some form of interactive control to an audience.
I have often pondered whether the increased use of interactivity within art signifies a new medium for artists or a new movement being created. A medium usually refers to a physical substance that carries impressions to the human senses, such as oil paint on canvas; an art movement refers to a group of individuals who are working towards the formation of a new artistic style, such as the Minimalists.

Interactivity appears to fit the typical definition of a medium because it exists between a creator and a person who experiences a finished work. Unlike other media, however, such as paint or sculpture, interactivity is not a physical substance; interactivity is a method of interacting with media, but is not a medium in itself.

Although the creation of an interactive work involves physical materials, such as input devices and video monitors, these physical items alone are not interactive media. Interactivity is provided only after a system of reciprocation has been incorporated between an input device and an output device. Although interactive art usually involves some form of physical motion, the intangible quality of experiencing interactivity provides a cognitive experience more than a physical one.

It is difficult to view interactivity as a movement because the various creators of interactive experiences have diverse goals. The CD-ROM designer, the interactive installation artist, the Web page programmer and the interactive television producer all have different reasons for using interactive technologies within their finished works. Perhaps interactivity is neither a medium nor movement, but rather a new method of communication between persons and media.

My own involvement with interactivity was not obtained through a specific desire to create interactive art, but through a series of circumstances and interests. Although my early aspirations were in the visual arts, I was first educated in electronics engineering, planning to use this background as financial support for future artistic activities. In the late seventies, a telecommunications manufacturer hired me as circuit board designer, requiring extensive use of computer-aided-design and computer graphic equipment. At this time, however, I had little interest in using electronic media for artistic projects, preferring oil paint and expressionism to computer graphics.

I pursued formal studies in fine arts and psychology after working for a few years in engineering, funded by summer employment as a hardware designer. Eventually the psychology education and my experience with CAD/CAM systems led to employment by Bell-Northern Research as a human interface designer for telephone equipment and CAD/CAM software. Although these experiences with technology occurred at the same time as my fine arts education, I did not initially combine the two fields into specific design or art projects.


Tomato Insertion Device, sculpture 900 x 250cm, 1983

In *Tomato Insertion Device* [1983] I created a fictitious weapon from a welding gun, aluminum parts, industrial hose and a white plastic sphere. Underneath the sphere was a muffin fan, the type used to cool computer equipment. The top of the sculpture held two sharpened aluminum blades which were connected to the plastic sphere through a large diameter hose. To use the device, a user held the welding gun handle and pushed the sharpened blades into the head of an unsuspecting victim. Once penetration was obtained, the fan was activated by a finger operated trigger which propelled tomatoes from within the plastic sphere into a victim's head. In retrospect, this machine was clearly influenced by my interests at the time, being Marcel Duchamp, Conceptual Art and human interface design.

"The history of every art form shows critical epochs in which a certain art form aspires to effects which could be fully obtained only with a changed technical standard, that is to say, in a new art form"
[Walter Benjamin, 1932].

After exploring art and technology as separate fields for approximately 15 years, I began to purposely combine the two fields during my graduate studies at MIT. I presented various computer animation and video tapes through a system consisting of a video projector, mirrors, projection screens and sound system. Named *RGB Room* [1986-1988], this system provided a 3 x 9 metre video image on three screens, one containing red imagery, one with green and a third in full colour. My first interactive installation using this system was *Stithy* [1988].


Stithy, video frames from interactive installation, 1988

Stithy had two forms of interactivity, the first used in the creation of the installation and the second available to the viewers. For creation of the video imagery, I developed an interactive video software which provided control of digital video sequences through a musical instrument. Interactivity was provided to the viewer of the installation through a switch that was placed inside of a large sketch book mounted on top of the video projector. Viewers could examine sketches of the installation within the sketchbook and eventually locate a large

light switch bolted to the pages. When the switch was placed in one position, the installation presented two large paintings on the floor, illuminated with spot lights. When the switch was placed in the other position, the spot lights turned off and the viewer could observe a large video projection.

Person-Media Variables

In 1986 I began differentiating media not by their physical qualities, such as oil paint or film emulsion, but rather by a medium's human interface. For example, a person usually experiences a film while seated in a darkened theatre with the head facing forward and tilted slightly upward. In contrast, a painting exhibition is usually experienced while walking through connected rooms and turning the head from side to side to view paintings approximately at eye level. From a human interface perspective the difference between painting and film is that painting is experienced while walking with plenty of head and body motion, while film is usually experienced sitting down with little head movement.

Human communication with a medium can take on two general forms: input or output. When a person inputs to a medium, such as animation software, a work is being created. When a finished work is being experienced, such as viewing computer animation, the medium is outputting to the person. To categorize the human interface differences between media, I have coined the term Person-Media Variable [*Ritter*, 1988]. This term is intended to describe the various physical and psychological factors — including input and output — involved with communication between persons and media.

Person-Media Variables are categorized into four general groups which encompass the creation and experience for any medium: Formal Variables, Content Variables, Input Variables and Output Variables. Formal variables are similar to those used in visual art, being concerned with the basic compositional elements in imagery, such as the use of a particular colour or shape. Content variables are the psychological interpretations of images, such as the use of an icon to represent a belief.

Input variables are the physiological and psychological factors surrounding persons who create perceptual experiences. These variables are not concerned with the specific sound or imagery being created, but with creators' motivations and techniques for creating works using the tools of a medium.

Output Variables are the physiological and psychological conditions surrounding the experience of perceptual creations. Although these variables are concerned with the conditions surrounding viewers, the concern is only with the identities, motivation of viewers, and manner of presentation. In the above example of film and painting, the Person-Media Variables being discussed were Output Variables, specifically "body position" and "body parts used."

Although I have not identified all of the physiological and psychological factors involved with the creation and experience of media, I have identified 68 Person-Media Variables to date. Some of these are listed below:
Input Variables: body position, body parts used, motivation, environment
Output Variables: required knowledge, body position, body parts used
Formal Variables: grounds utilized, hue dominance, light type
Content Variables: iconography, objects, actions, style

Using the Person-Media Variables, developments in art movements appear mostly to be changes in Content and Formal Variables, such as the use of Biblical stories within Renaissance paintings or the use of colour by the Expressionists. Less development has been in the exploration of different human interfaces for media. Although form and content are extremely important in the creation of art, consideration can also be given to the method of communication between art work and a person.

"Physiologically, man in the normal use of technology [or his variously extended body] is perpetually modified by it and in turn finds ever new ways of modifying his technology. Man becomes, as it were, the sex organs of the machine world, as the bee of the plant world."
[Marshall McLuhan, 1966]

One purpose for creating and identifying Person-Media Variables was to classify the current use of media from a human interface perspective. The primary purpose of the Person-Media taxonomy, however, was to develop a technique for creating new perceptual experiences and, hopefully, new forms of art. Basically, the technique involves the random and purposeful manipulation of Person-Media variables for a particular medium.

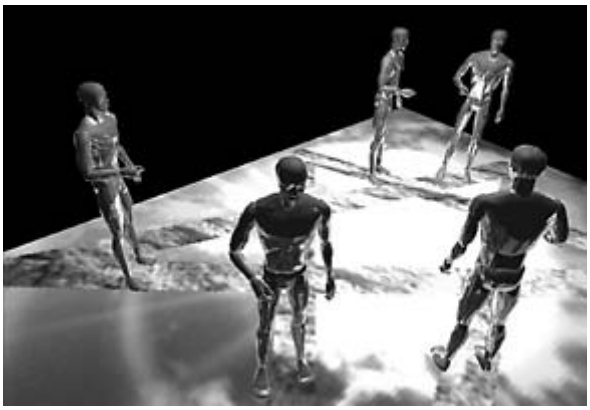
When creating with any medium, I now determine if my decisions are selected consciously or merely according to convention. After finding myself using a Person-Media Variable conventionally, I ponder on a variety of unconventional possibilities. For example, it is a convention to present video projection in a similar manner to film, in darkened rooms on vertically oriented screens. Many other environments are available for projection, yet they are rarely used.

The importance of examining the conditions of Person-Media Variables with new media, such as computer animation, is to determine if a new medium is being used in a conventional manner, as was used with older media. By focusing on the use of novel human interfaces for the creation and experience of art works, new perceptual experiences can be created using traditional, contemporary or forthcoming media tools.

Captured Moments

Captured Moments is a series of interactive video and sound installations which provide interactions with people, interactions with nature, interactions with machines, and interactions with mass media. Sound and imagery occur continuously within these installations, even in the absence of visitors; when visitors are present, however, they instantly influence the installations. Specific sounds and imagery are presented according to the number, location, movement, lack of movement, and time of movement.

When a visitor leaves one of these installations, sound and imagery return to the state prior to a visitor's presence. A visitor's impact is only temporary, having no lasting effect on the nature, machines or mass media contained within the installations. Although a single visitor's presence and movement within the installations causes specific imagery and sound, the combined activities of all visitors will cause events not possible with a single visitor. Visitors must co-operate with each other to experience the works to their full potential.


Skies, interactive video and sound installation, 1996

The installation *Skies* within the *Captured Moments* series involves interactions with nature. Visitors encounter four channels of sound and moving video imagery, 7 by 5m, projected onto the floor. The installation is larger than the projected imagery, permitting visitors to walk onto the imagery or in the surrounding area. When no visitors stand on the projection, the imagery presents a night sky containing a moon, covered with slow moving clouds.

Upon entering the imagery, visitors discover paths appearing under their feet at specific locations. If a visitor walks down a path, the night imagery will transform into a new type of imagery. When a single visitor walks off a path, the path and associated imagery will immediately disappear, and the night sky will return until another path is located. Thirty-two different video sequences and sound tracks are contained within the installation, their selection determined by the number and location of viewers.

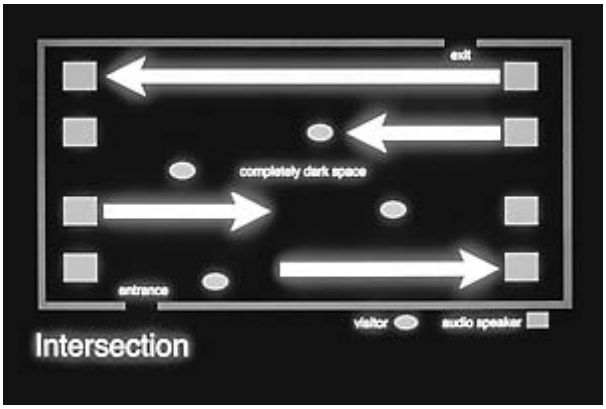
"… TV has, some feel, introduced a kind of rigor mortis into the body politic."
[Marshall McLuhan, 1966]

The installation within the *Captured Moments* series involving interactions with mass media is *TV Guides*. The title refers to "TV Guide," a popular magazine in Canada and United States which lists weekly television programming. Visitors to *TV Guides* encounter a living- room environment containing a television playing live broadcasts. Visitors encounter typical afternoon programming of soap operas, talk shows, advertisements and game shows, although the imagery on the television is slightly obscured by cross hairs within a circle.

In response to any form of movement by visitors, the television sound fades out and the image becomes a black screen with text requesting the viewers to "Please Remain Still." The television program will resume only after all viewers have remained still for at least five seconds.

Intersection

Intersection, Interactive sound-installation. Details with lights on, 1993-95



Intersection, diagramm of interactive sound installation, 1993-95

The installation within the *Captured Moments* series that involves interactions with machines is *Intersection* [1993-95]. Visitors to the installation encounter the sounds of speeding cars traveling across a completely dark room, typically 13 by 8 metres. The illusion of traffic is created through digital audio devices and eight audio speakers arranged to create four invisible lanes of traffic.

If a visitor stands in the lane of an approaching car, this car will "screech" to a halt and remain "stopped" with its engine idling. Traffic will continue in the other lanes. When a visitor leaves a lane containing a "stopped" car, this car will quickly accelerate and continue travelling across the space. When a visitor remains in a lane with a "stopped" car, however, 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. An unlimited number of visitors can be accommodated by the installation at one time.

Intersection typically induces a sense of fear or amusement in a visitor. In addition to creating a work involving interactions with machines, the work is intended to confront people with an unknown and uncertain situation within the darkened space. In the past, some visitors to the installation have been so frightened by the work that they were unable to enter or cross through the installation. A previous exhibition of *Intersection* positioned the work at the front of a museum, forcing visitors to walk through the installation in order to view the other exhibits. One distressed visitor approached me and nervously stated his predicament at being unable to walk through the installation. He was eventually given entrance to the other exhibitions by walking through a service entrance at the back of the museum.

The exhibition of *Intersection* at Ars Electronica will be the first time the work has been presented out of doors. Positioned over the bicycle path just outside of the Ars Electronica

Center, *Intersection* will be activated by bicyclists and pedestrians who will encounter the sounds of cars passing by, stopping, accelerating and smashing into each other.

"Technologies begin to form the function of art in making us aware of the psychic and social consequences of technology."
[Marshall McLuhan, 1966]

Experiencing interactive communication is not a new phenomenon. Interacting with any living entity is a reciprocating experience where the words and actions of one participant will affect the other. With the existence of various digital technologies, the potential now exists to create interactive experiences between persons and media. I believe these technologies provide exciting opportunities because artistic experiences can now be created which involve a viewer's entire body and all senses.

One method of exploring the potential of interactivity is to examine the communication between persons and media, specifically to examine how one physically inputs an intention into a medium and also how one receives perceptual output from a medium.

The difference between communicating with a non-interactive medium as opposed to an interactive medium is like the difference in viewing a photograph of a person and having a conversation with that person. Having a reciprocating interaction with any entity is an experience of participation, providing one with the ability to influence and to be influenced by their world.

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