

FROM COMPUTER ART TO DIGITAL ART TO NEW MEDIA

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Before any discussion of the history of New Media can take place, one has to define the terminology. There has to be a consensus as to what falls into this category. The title of this talk, "From Computer Art to Digital Art to New Media" indicates the lineage of the term. These terms have changed but not the definition. As the terms have evolved they have not become more distinct but broader and more difficult to define.

Computer Art was a term that was used at the beginning of this art form. It evoked the mechanical, bringing up the question of whether people could produce art with a machine. The word digital has evolved to express the process of the machine. It is digital because it comes from discrete bits and bytes. It is digital because the computer interpreted the images, the audio, or motion in a discrete format. Today most all media is digital or manipulated digitally.

Of the three terms used in this title, New Media is the most general and ambiguous. 'New' is relative. Every day there is something new. In the 1970's the term 'new genre' was used to describe a new art form that involved video. Is this still the new genre? Is New Media the new genre?

The term New Media has been used to refer to electronic media which has been in existence since the 1940's. Sixty years later and into a new century, I think it is time to redefine this term. The definition I like most involves interactivity, the very item that makes it unique to the computer medium, and most specifically in today's world, interactivity on the Internet.

The new media are oriented toward action, not contemplation; toward the present, not tradition. Their attitude to time is completely opposed to that of bourgeois culture, which aspires to possession. Hans Magnus Enzensberger, "The Constituents of a Theory of the Media", in John Thornton Caldwell, Electronic Media and Technoculture, Rutgers University Press. Originally published in 1970, the New Left Review.

New Media (interactivity on the Internet) has evolved from large-scale interactive installations that artists have been creating since the invention of the computer. These large-scale interactive installations are the 'history of new media.'

An interactive system is a machine system which reacts in the moment, by virtue of automated reasoning based on data from its sensory apparatus... Interactivity implies real time. Simon Penny, "From A to D and back again: The emerging aesthetics of Interactive Art." <http://www-art.cfa.cmu.edu/Penny/texts/AtoD.html>. First published in Leonardo Electronic Almanac, April, 1996.

The computer was in full operation in the 1950's. In America this was a time of renewed prosperity. People returned from a world war, women were sent home after being in the work force to become wives and mothers again. New communities of suburbs were being built. These were homogeneous neighborhoods with rows and rows of the exact same house. At the same time, a subculture was growing to counter this establishment. This subculture grew to new heights in the 1960's, and changed the face of the culture permanently. The conservative establishment via the military industrial complex and the anti-establishment subculture, by way of a small group of techno-enthusiast, advanced the development of computer technologies. The counterculture wanted to break all of

society's rules. Actively challenging the norms as opposed to passively accepting in silence. This activist stance affected the art world as well. Be-ins and events replaced the 'object of art'. To experience became more important than to possess, in direct counterrevolution to the prosperity of this time.

In the 1960's artist Robert Rauschenberg and electrical engineer Billy Kluver initiated a series of events to bring about collaborations between artists and engineers. "9 Evenings: Theatre and Engineering," in 1966 was the first. Experiments in Art and Technology (E.A.T.) Organization was formed after this landmark event and sought to link artists and engineers in collaborative projects.

Documentation on the E.A.T. organization can be found in the Getty Research Institute web pages <http://www.getty.edu/gri/htmlfindingaids/eat.html>. More events followed. Some of these included linking people in public spaces in different countries by the use of telephone, telex and fax equipment. Other collaborative projects manifested into cybernetic sculptures.

Through information science and cybernetics a whole new situation is created: artworks can be conceived as automata which evolve their own activity or react to welcome interventions from the public. Such objects are considered to be cybernetic art. Herbert W. Franke 1979 Prologue in Ars Electronica Facing the Future. 1999.

Edward Ihnatowicz created the Senster in 1970. The Senster responded to people's voices and their movements, which it detected by means of radar, and was the first sculpture to be controlled by a computer, according to New Scientist May 4, 1972. Wen-Ying Tsai created such sculptures as Victory (1971), Semisphere (1972), and Tuning Fork (1974). His work Cybernetic Sculptures, 1975, were composed of moving fiberglass rods illuminated by strobes. The movement of the strobes responded to sounds made by people around them. The rods would move slowly when the environment was quiet, frantically when it was noisy.

During this time Myron Krueger, at the University of Wisconsin, experimented with interactivity in a Virtual Reality setting. Krueger, with a computer science background, collaborated with artists. In 1970, he exhibited an environment called metaplay in which participants interacted with a video projection screen, which combined computer graphics with live video. In 1971, Psychic space used a sensory floor to perceive the participants' movements around a graphic maze. Videoplace, first created in 1974, allowed people to affect movement of images on a large screen projection. Interface was important to Myron Krueger. He wanted to get away from archaic devices such as the keyboard and have people interact in a more natural way with the computer.

Another artist, working in the 1980's, who placed a high importance on interface was David Rokeby.

...the rush to stuff content into interactive media has drawn our attention away from the profound and subtle ways that the interface itself, by defining how we perceive and navigate content, shapes our experience of that content. David Rokeby, "The Construction of Experience: Interface as Content" in Digital Illusion: Entertaining the Future with High Technology edited by Clark Dodsworth, Jr, Addison-Wesley Pub.

He is known for his installation, A Very Nervous System, which responded with audio (not visuals) to human movement. This system was an intelligent system that could track the dynamics of one's movement and because the audience was directly responsible for the quality of sound, the piece invited interaction. This was a seductive and provocative experience that truly made the audience part of the piece.

I want to mention a few works created in the 1990's, not very historical but significant in involving social interaction from human to machine and back to other humans. Multi-user systems were created by both Perry Hoberman and Toshio Iwai.

Perry Hoberman, once an art director of Laurie Anderson's performances, started working in interactivity in 1990. With the creation of Bar Code Hotel, he uses as his interface the symbols found on consumer products. The multiple participants scan bar codes to select computer-generated objects on a large stereoscopic projection. People work cooperatively to compose the visuals.

Toshio Iwai in *Composition on the Table* 1999 blends virtual interfaces with physical ones. Four tables with multiple buttons, dials, or sliding panels are adjusted by participants to affect audio, along with visuals that are then projected back onto the table tops. Social interaction is highly demonstrative. People stand in close proximity with each other and their personalities are exposed. Some dominate the play, some comply, and others actively oppose the domination. With another group of people there can be more of a cooperative spirit.

A significant development in Virtual Reality is a room size, multi person, interactive installation called the CAVE. This is a successful attempt in creating a VR community space instead of a lone, individual experience. Developed in the Electronic Visualization Lab, at the University of Illinois, Chicago, in 1991, this technology has since been used by artists in a variety of museums and art shows. One significant piece entitled *World Skin* by Maurice Benayoun is "a photo safari in the land of war... where the audience removes parts of memory, taking photos in the virtual world. They leave the virtual land of war with the printed shots, material witnesses of the lost memory." Maurice Benayoun, "Experiential Computer Art," Siggraph Conference Abstracts and Applications, 1999.

Multimedia

Another example of artists collaborating with computer scientists brought about the birth of multimedia. Nicholas Negroponte documents this in his book entitled Being Digital, 1995. The American military asked the Advance Research Projects Agency, ARPA, at MIT, to investigate electronic ways in which American commandos could get the kind of training that the Israelis had to launch an extraordinarily successful strike on Uganda in 1976. The Israelis built a physical model to scale of the airport. Using the computer allows for removal from the physical world. A full photorealistic environment was needed and the Aspen Movie Map was created. This was created by Andrew Lippman and his group at the MIT Architecture Machine Group, including artist Michael Naimark. The project used videodisc technology to allow participants to drive down the streets of an entire town. Every street was filmed, and every turn was filmed in both directions. The project, completed in 1978, used the computer to track movements and responded by playing the correct video for that portion.

This was not only about mixing multiple media but about control on the user's part. It was about interactivity. Interaction is implicit in multimedia, leading towards selection of information and outcome.

Artists experimented with videodisc technology in the 1980's and still use it today. This required an analog video signal recorded onto the disc that was controlled by the computer. Full frame video was utilized. Lynn Hershman became one of the first artists to use the videodisc technology in her work entitled *Lorna*, 1979-1984. A woman fearful of the world after watching television news, trapped herself in her room. Viewers could access buttons on their remote control unit to find out information about Lorna and her situation, and control her destiny by selecting one of three possible endings.

In the late 1980's early 90's, computer companies started experimenting with digital video on the computer. This gave artists the ability to create CD ROM multimedia projects. Computers were not fast enough to display full frame video therefore small video clips were used. Published by Voyager multimedia publishing company *She Loves It, She Loves It Not: Women and Technology* was created by Christine Tamblyn, Marjorie Franklin, and Paul Tompkins at San Francisco State University's Faculty Multimedia Research and Development Center in 1993. It is a parody of how women are represented in a technological age and of how women might use technology differently.

Interactivity as an on-line phenomenon on the Internet

The world wide web allows the public to become active participants. Viewers can be active in two ways; both as publisher, and through sites created for user participation. The more innovative New Media sites on the Internet are ones where one can give input or where there is an exchange. Artists explore interactivity on the web not merely as a point and click phenomenon but as an exchange of ideas. Artists are creating intelligent systems to respond to decisions being made by the participant, allowing the participant to be actively involved in the creative process.

A unique project that utilizes existing web cameras' live images from multiple sites is Amy Alexander's The Multi-Cultural Recycler.

Ordinary people and places around the world are instantly subject to becoming part of the mass culture and are potentially also subject to cultural recycling. It examines the meetings and collisions of all of these disembodied representations out in cyberspace. The live images will be captured from their web sites, and processed through one of roughly twenty image processes. Creating a collage which is a document of their relationship as fragment of web culture and of their chance meeting in cyberspace. The Multi-cultural Collider, Cyberarts, ARS Electronica 97.

<http://shoko.calarts.edu/~alex/recycler.html>

The cooperation of a world wide community is needed to cultivate the TeleGarden, first online in 1995. This is an Internet example of social interaction in virtual space.

The TeleGarden is a tele-robotic installation which extends out from the web site. It allows participants to view and interact with a physical garden via a robot arm. "Internet behavior might be characterized as 'hunting and gathering'; our purpose is to consider the 'post-nomadic' community, where survival favors those who work together." Co-directors: Ken Goldberg and Joseph Santarromana (UC Irvine).

<http://queue.ieor.berkeley.edu/~goldberg/garden/Ars/>

Another large-scale communication sculpture controlled through the Internet is Thomas Lehner's Clickscape98. This ambitious project was a one week event. Users from all over the world had the ability to affect text, visuals, and sound in three separate physical spaces. The text of LED lights scrolling across a building, the lights in windows of a high-rise, and sound through 16 speakers on the Nibelungen Bridge in Linz, Austria, all were controllable by the input of a mouse click.

<http://www.servus.at/clickscape98/>

The potential of what Thomas Lehner's piece and others represented is enormous. These projects utilize the medium in most compelling ways, and utilize the computer and network systems to the fullest. It opens up many possibilities for a digital future. What led to the creation of this high level of interactivity on the web were the large-scale interactive installation of the present and the past.