

ENVIRONMENT-SENSING ARTWORKS AND INTERACTIVE EVENTS: EXPLORING IMPLICATIONS OF MICROCOMPUTER DEVELOPMENTS

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Abstract—Art that intends to explore contemporary technological developments ideally would use the new technologies themselves in that exploration. The author describes his art, which explores various computer capabilities including the ability to interact intelligently with humans, the ability to sense and respond to environmental characteristics of the world such as time and temperature, and the ability to synthesize and recognize human speech.

I. INTRODUCTION

People often ask me what medium I work in. The answer "computers" usually satisfies them; but it does not satisfy me. In my view, this answer obscures more than it reveals. The function of computers in my work is fundamentally different from the function of oil or acrylic and canvas in the work of most painters. Computers are not just tools for realizing particular images, sounds, or sculptural installations. And the sensuous qualities—as well as the potentialities and limitations—of the sounds and sights they produce are not the most important features. Instead, the focus should be on the ways computers handle information and the new social structures these information-handling capabilities create. Ironically, the most powerful way to explore these possibilities and implications is by using the technical capabilities and social structures themselves as esthetic elements [1].

Relationship between artistic 'medium' and focus extends beyond computers to a wide range of technological and scientific developments. Reflection on the human condition in the contemporary technological world and adequate response to that condition demands analytical, hands-on application of technology, experimentation regarding the new capabilities, and a willingness to work in the new contexts created by new technology outside the traditional art world. The tendency of artists to cling to traditional media to communicate their reflections limits the scope of those reflections.

I have attempted to find appropriate artistic approaches for celebrating and probing the impact of computer-created conditions and possibilities on human experience. To respond powerfully to contemporary technology and science, artists might have to transform radically the character of their work. They might need to expand beyond traditional media to encompass new processes and materials. Artists might work outside the familiar settings of studio and gallery. They might need to acquire some of the understanding and skill of the engineers and scientists with whom they explore these new areas. Audiences and critics also might need to be reeducated.

Artists historically have stood watch at the cultural frontier. But they are in danger of failing as interpreters and forecasters of culture as the frontier becomes increasingly technological. In the last century artists expressed their views on technological

change by creating images and objects in traditional media (for example, the impressionists' views of train stations, the cubists' and futurists' views of motion, and the surrealists' views of time). In the future these expressions or reflections may seem increasingly irrelevant and lame, for artists will drift and gradually become bystanders. The traditional materials they use will lack the creative punch of the technological developments to which they respond.

Think of the romantic image of an artist painting a steam engine speeding across the landscape. Maybe it is time for artists to get on the train. If artists had got their hands dirty working with steam engines, they might have influenced industrial expansion and discouraged some of its ugly extremes. Maybe steam engine technology itself might have developed on different paths.

Creative fires are white hot in the technological areas of our culture. Developments are happening in space exploration, molecular biology, computers and artificial intelligence, and communications electronics. I worry about a society where artists, instead of taking part, watch from the balcony. Both technological research and society would benefit from a scientifically competent artists' community, sufficiently skilled to actively help shape research or to reflect on it close up rather than from afar.

Weightlessness, an example from space exploration, illustrates my point. Weightlessness is a new human capability and experience made possible by technology. It will have increasing impact on our culture. Artists can best fulfil their cultural role of supporting reflection on this potential not by painting pictures of people floating but by creating art forms that depend on physical weightlessness. I foresee the day when artists, questioned as to what medium they work in, might reply, "gravity", "the electromagnetic spectrum", or "genetics".

I approach my art in this spirit using technology to explore its implications. I am moved by the possibilities, opportunities, and dangers created by computer developments. I create art using these potentialities to ask questions about them. Critics have trouble categorizing my work. They fix on the images and sounds generated by my computers because these by-products are familiar; yet these clearly are not the most important features of my work.

II. ARTWORKS

Several of my artworks explore the implications of computer potentialities. In each, the computer-generated possibility is both an esthetic focus and a tool that helps communicate that

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had activated (by placing sensitive photocells behind the photo), the computer shared my reflections about that spot in the photo. For example, the computer text might consider the function of that spot in the composition of the photo or might speculate about the political significance of the object at that spot.

'Computerized Street Events' was located in two store windows on a street in a business district. TV monitor text and computer sounds in each window invited passers-by to activate the events by touching sensors affixed to the windows. The participants then selected from several events and made choices within these events by touching the numbered sensors, which were connected to the computer, as were the monitors. Figure 2 shows passers-by interacting with the windows. Some of the events required people in the two windows to work together and often strangers found themselves conversing.

For example, the 'Street Action' event allowed people in the two windows to work together to draw a computer graphic by touching the sensors. Periodically the computer offered to increase their options if participants answered a question about the near environment (for example, the number on the street light across the street or the color of an architectural detail on a building two doors up the street). The scene was refreshing to

watch: people touching a window they usually walk passively past, running to look at details of the environment, and talking and laughing with strangers.

As people went up and down the escalators at the University of Illinois-Chicago Student Center during my 'Interactive Escalator' work, they could affect video, sound, and lights by touching sensors on the walls hooked up to a microcomputer. Figure 3 shows several travelers on the escalator touching interactive sensors. I programmed the computer to make special events happen if several people touched the sensors simultaneously. For example, with the sound option operating, one person on the escalator could make sounds of increasingly higher pitches as he touched sensors further up the escalator. Several people touching the different sensors together could generate more complex tunes.

C. Connecting to environmental characteristics

Artists have long been fascinated with changes in the environment and have designed works to focus viewers' attention on these changes. For example, in his series of haystacks at various times of day, Monet explored changes of light and the daily passage of time. Turner often highlighted weather changes. In part these artists wanted to freeze one set of changes they observed, but I imagine they also wanted to make the audience more observant and appreciative of the changes occurring in their world.

These artists had to be content with using an allegorical process to sensitize their audience. Microcomputers connected to a variety of sensors allow artists to create works that respond directly to characteristics of the viewer's current physical environment in a precise and direct way. Unlike the works described in previous sections, these do not focus on human choices but on physical qualities such as time of day, time of year, temperature, amount of light, rain and sun, barometric pressure, vibration, movement of objects in the surroundings, and electromagnetic radiation. Any change that a sensor can convert into an electrical pulse can be read by a computer and used to shape what the computer creates—for instance, video imagery, sounds, sequences of lights and physical movements. The viewer's experiences change with changes in the environ-



Fig. 2. 'Computerized Street Events'. A microcomputer enables passers-by to make choices that affect video and sound art in a storefront gallery window, 1981.

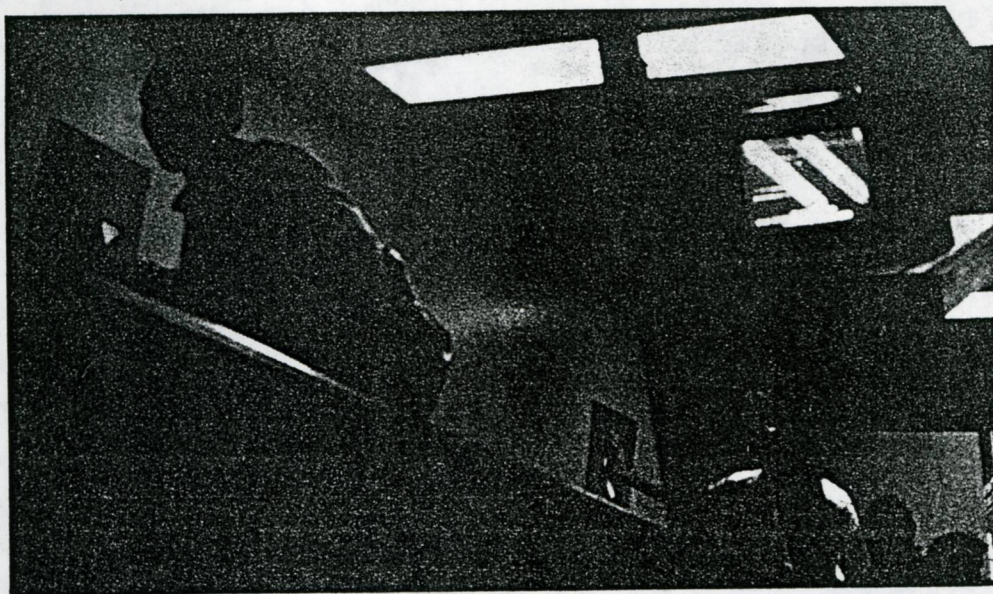


Fig. 3. 'Interactive Escalator'. A microcomputer allows people to work together to create art events, 1981.