Mastery

Computer Games, Intuitive Interfaces, and Interactive Multimedia

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THE AUTHOR SUGGESTS THAT AN ESSENTIAL ASPECT OF VIEWER experience has been deliberately excluded in the design of "serious" (i.e., nongame) interactive works. The satisfactions afforded by acquired expertise are a cardinal ingredient of the computer game experience, but anathema to the current conception of effective interface design for nongame applications. The author argues that this is a serious omission that debases the expressive and communicative possibilities of interactivity. In the rush to develop the interface that requires a no-effort, no-time learning curve, producers sacrifice the pleasures of connoisseurship and expertise, necessary features for the comprehension and appreciation of art and literature, whether it is "high" or "low," serious or playful, mainstream or avant-garde.

In the Sega signature series of video games (*Sonic 1, Sonic 2, Sonic 3,* and *Sonic and Knuckles*), both the obstacles that impede the characters and the devices that assist them are not cyber-machines governed by lighter-than-air laws of cyberspace. They are simulations of springs, ratchets, and pulleys, encumbered by familiar mechanical principles—weight and gravity, linear and angular momentum, elasticity, and leverage. The cartoon creatures need air to breathe, rotors, wings, or gyroscopic platforms to fly, angular momentum provided by springs or rocket motors to navigate loop-de-loop tracks, and trampolines to leap to colossal heights. The environment in which the game player directs the motion of Sonic the Hedgehog and his colleagues, Tails and Knuckles, is a Newtonian physics demonstration, a pool table, a roller coaster—the world of H. G. Wells or Jules Verne, not that of William Gibson or Simon Ings. Unassisted flight, "beaming up" (in the *Star Trek* sense), hyperwarp speed, and Roadrunner rates of acceleration (to say nothing of time travel or jacking into and cruising around a database) are not features of Sonic's environment, nor of the worlds of most Sega and Nintendo games. (I am thinking of character animation games such as *Earthworm Jim, ToeJam and Earl,* the *X-Men* games, *Batman, Aladdin,* and *The Lion King,* not the sports simulations, in which the need to replicate the physics of the real world is obvious.) The milieus these games depict are strangely nineteenth century, unfuturistic, non-science-fictional, though we like to take their international prevalence (not to mention the huge gross earnings of the corporations that make them) as signs of the encroachment of a future on the present. And, I would say, rightly so.

On the other hand, though the physical laws of the simulations are those of high school mechanics, the spaces depicted cannot be described within the traditional educational curriculum. Buildings with no visible support structure ascend infinitely, so that characters can keep climbing up and up and up, while valleys descend equally far into the bowels of a virtual earth. Once a character moves from one path onto another, going back does not necessarily return him to his initial course. Spatial continuity is either absent (there is no connection between one area and the next) or overpresent (when, for example,

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advancing far enough brings you back to your starting point). Thus the game player (typically a boy between 7 and 14) operates in a represented space that is geographically and architecturally impossible, though administered by an idealized set of mechanical laws.

A possible explanation of this is that the laws of nature in the space of the video game must be immediately comprehensible, while the space depicted can extend endlessly in any direction without affecting the player's moment-by-moment navigational understanding. He maneuvers the keypad or joystick with two general aims: *acquisition* (of tools, health, weapons, and powers) and *destruction* (of obstacles, enemies, and "bosses," which can sometimes be avoided rather than destroyed). The overall goal is to preserve life and health so as to reach new levels of play. It might be that operating in a world of familiar laws makes the game more intuitive, but this does not seem right to me. There is a harsh learning curve associated with all these games—I would even say that ascending the learning curve *is* playing the game—and a player could easily adapt to a new set of physical laws at the same time as he gets in synch with the rhythms of the game, learning how different combinations of buttons jump, hit, kick, shoot, climb, cling, and crouch. Indeed, in some older games, characters can fly without assistance, swim underwater without breathing, and transmigrate from one place to another; these games are much less compelling.

> She drove the San Diego to the Harbor, the Harbor up to the Hollywood, the Hollywood to the Golden State, the Santa Monica, the Pasadena, the Ventura. She drove it as a riverman runs a river, every day more attuned to its currents, its deceptions. . . . Again and again she returned to an intricate stretch just south of the interchange where successful passage from the Hollywood onto the Harbor required a diagonal move across four lanes of traffic. On the afternooon she finally did it without once braking or once losing a beat on the radio she was exhilarated, and that night slept dreamlessly. . . . Sometimes the freeway ran out, in a scrap metal yard in San Pedro or on the main street of Palmdale or out somewhere no place at all where the flawless burning concrete just stopped, turning into common road, abandoned construction sheds rusting beside it. When that happened she would keep in careful control, portage skillfully back, feel for the first time the heavy weight of the becalmed car beneath her and try to keep her eyes on the mainstream, the great pilings, the Cyclone fencing, the deadly oleander, the luminous signs, the organism which absorbed all her reflexes, all her attention [1].

My guess is that the overtly mechanical world is designed to create a visceral resistance, to keep the player anchored in his seat, to make him feel as if the laws of the simulation are precisely the laws of the world he is struggling to overcome in daily life, as he plays soccer and basketball in the schoolyard and glides around the streets on his rollerblades or skateboard. Gravity and friction are opponents; elasticity, momentum, balance, and coordination allies. The rhythms of the newer games are not based on *speed* of hand-eye communication so much as on unexpected accents and *changes* in tempo. Reaction time, in other words, is no longer the winning ingredient as much as adaptability and familiarity with the ebbs and flows of the game's changing currents.

> Anyone can "drive" on the freeway, and many people with no vocation for it do, hesitating here and resisting there, losing the rhythm of the lane change, thinking about where they came from and where they are going. Actual participants think only about where they are. Actual participation requires a total surrender, a concentration so intense as to seem a kind of narcosis, a rapture-of-the-freeway. The mind goes clean. The rhythm takes over. A distortion of time occurs [2].

The point of the game is to keep the player between two edges—on the verge of mastery, on the verge of losing control, so that a little more effort, a little more timing, a little more spring and coordination will allow him to reach the next level—and a little less will result in a death. The pleasure is in

overcoming what was insurmountable just a few minutes ago.

The truth is that we cannot go faster than the computer, and every player knows it. In order to keep us believing the patent falsehood that we might be able to beat it, the computer depicts a world of nineteenth century machines, an Adam Smith world of profit and loss, credit and debit, a struggle against powerful but not omnipotent laws that we know we can overcome with our better contemporary artifacts, or even with our bare hands. It is a pure illusion. The computer eventually will outpace the player—and indeed when it is too easy to beat, the game is a disappointment. Lose if you win, lose if you lose—an outlook that increasingly characterizes our century as we approach the end of it. But the point of the game, what keeps the boy playing, is a promise—the intimation that with enough energy, enough focus, and enough lives, he might master this machine.

Mastery. Even when I write a personal letter now, there are two mental activities involved—the creative act of writing, and the expertise I draw on to operate the device with which I write. I've more or less learned the word processor, though there are always unexamined features, software upgrades, new output devices in the chain. The fact that I can endlessly edit without appreciable effort enables me to input a text early, perhaps too early, in the writing process. Before the word processor, for me at least, thinking was the first step of a writing project. Now, however, thinking *is* keying in, unpleasurable but necessary. And writing is editing. It would be an overt denial of the obvious to claim that this change in the *act* of writing has no effect on the *product* of the act. The notion of Wordsworth tapping away in Word Perfect 6.0 is patently ridiculous. What we write has always been deeply affected by the implements we write with.

Does it then follow that I might make a written work that grows out of the particular properties of the word processor? Can an artist "explore the nature of the computer" in a work?

You don't play pinball just with your hands, you play it with your groin too. The pinball problem is not to stop the ball before it's swallowed by the mouth at the bottom, or to kick it back to midfield like a halfback. The problem is to make it stay up where the lighted targets are more numerous and have it bounce from one to another, wandering, confused, delirious, but still a free agent. And you achieve this not by jolting the ball but by transmitting vibrations to the case, the frame, but gently, so the machine won't catch on and say Tilt. You can do it only with the groin, or with a play of the hips that makes the groin not so much bump, as slither, keeping you on this side of an orgasm [3].

Eco emphasizes the sexual in his description of the pinball experience; however, as he points out, pinball relies heavily on body movement and physicality. When the entire relationship with the screen is through the fingers, the physical aspects are diminished, though I have often seen kids twisting and grinding as they manipulate the control pad of a video game. It seems to me that the desire for mastery I propose as characterizing videogame play is not directly in the realm of the sexual but is more like a circus desire to tame the tigers of one's immediate daily environment, to bring them under the whip and make them jump through hoops of fire.

The "nature of the computer" lies in numbers, but one can take the mathematical analogy too far. Computers are not *constructed* out of numbers—they merely use numbers to perform their assigned tasks. Their basis in binary arithmetic, Boolean logic, and memory addresses is not available to the users of software. The word-processing program with which I'm writing right now cannot be reduced by me, the user—either intellectually or practically—to zeroes and ones, no matter how much of an expert at using it I become. Painters and sculptors, video- and filmmakers and photographers become caught up in the physical and chemical properties of the medium as their expertise increases—indeed, much recent art practice can be accounted for by this idea. But it simply doesn't make sense when applied to work produced with the aid of a computer.

Computers are chameleons. With computers we make models—of tools, of objects, of events, of processes, of situations. There are no qualities of the computer-as-tool, computer-as-medium that we can investigate in a grand modernist-reductionist-essentialist swan-song fantasy, because, as Timothy Binkley points out, a computer is not a medium. It outputs onto media, yes, it can *simulate* media with the appropriate software, but it has no integral features independent of what it simulates and outputs [5]. A word-processing program is always a program—it contains only what its designer put into it, and it does best what its designer intended for it. In the process of programming, however, there are often extra functions or possibilities implied by the code, because one feature incorporates or presupposes another. The best software designers follow up and exploit these leads and threads. Still, when a piece of software is conceived, designed, and written, the author certainly has in mind what it will be used for. In most cases this is reducible to an idea of what a successful session with the software will produce. For word processors this means nothing, since a word processor has to accommodate pre-existent forms of writing. Writing was not invented along with the computer software that is used to do it; rather the software had to be designed to match writing as it already existed.

There are always limitations to software. I, for example, cannot get any of the word processors I use to interleave material from two sources so that the texts alternate line by line. To perform this task it is most efficient to resort to mechanical processes—*actually* cutting and pasting. The limitations become more pronounced as we depart from forms as familiar as books and articles. The criteria for a successful image, for example, are continuously in dispute—art, as an essentially disputed concept, incorporates vagueness as a central element of its conceptual foundation—and the history of art is sometimes seen as a sequence of battles and takeovers, from one school or style to the next. Now, as much as ever, the qualities of a "good" image are hotly contested, and the developer of an image creation and editing program is obliged to take a position. To make a program that could as easily produce a Rauschenberg as a Twombly, a Dali, or a Haring would be a task not only Herculean but also unnecessary—different image creation programs emphasize different techniques and thus produce different kinds of pictures. The inverse of this is that any given program tends to produce the same kind of picture. It is no surprise to see similar Photoshop collages, based on scanned photographs, produced by students in art schools in Tel Aviv, Melbourne, Helsinki, and St. Petersburg. The software leads its users in certain directions. Of course, as they become more experienced, users find their own image language, forcing the software to do what they have in mind.

When we get to so-called multimedia, the problematic implications of this become apparent. "Multimedia" is a vague term without a meaning fixed by usage: the idea of a viewer's reaction actually affecting the video program he or she is watching is a recent development, not yet well understood. There is hardly a history of the form, no established canon, and few successful works, so there are certainly no agreed-upon criteria for quality. The basic grammar of interactivity is rethought with each new project. If I am right that production software implies the shape of the product, then the aesthetics of the form will be contained, or at least suggested, in its authoring tools. The language of multimedia is invented at the same time as its production techniques and processes.

The nucleus of the idea of interactivity is the viewer's capability to manipulate material as it is presented to him or her. The best model is cinematic—as the film program flows along, the

In analog media, the information is embedded in the physical substrate, but with digital "media" an interface is necessitated because the information is meaningless until the numerical extract is reconstituted in visual form. An interface to some physical device is essential, but no single one is dictated. Computer art seems like an orphan among media. Digital creations are not the offspring of any medium and have no home in physical reality [4].

viewer can affect its course. Interactivity is like an additional property added to the cinema: along with images and sounds, viewer impact becomes an element of the montage. How this additional feature affects the structure of a film program can be conceived in many ways [6]. However, the structure that appears to have become established is based on the viewer's *choosing* what he or she want to see next, and in most computer programs this is determined by where on the screen the viewer has clicked or which key has been depressed. The underlying program is organized into a tree structure of image segments, with branches at selection points. The main reason for the widespread adoption of this model, in my view, is that someone who has invested substantial time into learning a program that takes a specific approach to interactivity may begin to believe that it is the only, the right, or the best approach. A year or two later, when the producer has fully learned the production tools, he or she may be able to stretch the application into another function, to impose a different aesthetic shape on it; but this is like wearing someone else's clothes until they fit, finally feeling comfortable after the shirt and trousers have distorted themselves to the shape of your body—and are probably about to wear out.

Macromedia Director is the most widely used computer program for interactivity and is an excellent package in many ways. Very richly featured and with a powerful animation component, it can be adapted to produce a broad range of interactive works. However, it easiest to use Director to produce the kinds of interaction one expects to have with a bank machine—a series of screens, each one offering its own tree of selection points from which the user may choose. Thousands of works, often released on CD-ROM, have been made using this software, and most of them (not all! not all!) are predictably made up of graphic menus with "buttons" that lead to other graphic screens or animated information segments. The experience is like shopping in a department store. "You provide the content, we'll provide the technology!" is the war whoop of the computer hardware and software industry, anxious to keep those machines and software packages selling.

Though interactivity depends on change and is therefore a time-based form, the passage of time is difficult to address using Director. The most elementary cinematic tools (e.g., separating or joining picture and sound as the program progresses, making one event dependent on the prior occurrence of another) are hard to simulate without leaving Director's interface (and its scripting language, Lingo) and doing real computer programming.

You couldn't produce *Sonic 4* with Macromedia Director even if you wanted to. As a result, something of a chasm has developed between arcade-type games and multimedia, though there is no reason why the pleasure of real-time interaction, the pleasure of attainable expertise, and the sense of control afforded by the arcade game could not be used as ingredients of the multimedia experience.

Mastery has been a component of the appeal of art at least since the late Renaissance. Knowledge of the artist's oeuvre, genre, historical background, relationship with the work of other artists—connoisseurship, in short—is an important element of appreciation, whether one's interest is in the aural or the visual, low art or high, past or present. Pleasure that comes from expertise is essential in the arts. In contrast, the idea of knowledge acquired by learning is often considered undesirable in relation to computer interfaces, where immediate usability is more highly valued. The approach championed by marketing departments of software companies is that if a product cannot be used without reading the manual, it is unsalable, defective, ill-conceived. The idea of the "intuitive" interface has been promoted for over 10 years. It is not clear, however, that intuition, in relation to computers or anything else, is not learned.

The point is that even with computers, purported intuition comes later, after the user has mastered the program and it feels natural: just as playing the violin feels intu-

itive to someone who has practiced since early childhood. As Manuel DeLanda notes [7], some violinists can play faster than it is possible for the brain to send impulses down the nerves to the fingers—they play with the fingers, not the mind—and if this doesn't feel like intuitive behavior to the player, what would? However, it took decades for the player to achieve this state—here there is obviously no conflict between the sense of intuition and the fact that it is learned behavior. I would go so far as to say that the sense of intuition is phenomenologically closer to mastery than to unlearned immediate comprehensibility, if there is such a mental state.

The only appeal of an interactive work based on the menu model is its instant usability. Many people can quickly and "intuitively" slide past the interface right into the content, because most users of interactive multimedia are familiar with bank machines, word-processing programs, and so on. But in the process of conscious selection and decision-making, the potential of an interactive work of art begins to disappear. I have written elsewhere about the notion of an interactive cinematic space that incorporates simultaneity of action, multiple strands of time, and a sense that one is exploring the mind of another. The ideal is a responsive representation machine, responsive in its capacity to change according to how the viewer responds to it. With such a machine, a new language of cinematic communication will be possible, and a different kind of narrative can unfold. Like the arcade game, the interface of a work made for such a device could take some time to understand, and more time to master. But there would not be a sharp distinction between learning the *interface* and understanding the *content,* and so it is likely that the device would embody some of the fascinations and compulsions associated with the *Sonic* model. And in this machine, at last, there may be a form that deserves to be called interactive. Why has the paradigm of interactivity up to now been the menu of a fast-food chain and not windsurfing or rollerblading, activities that take some practice but in the end afford substantial satisfaction?

References and Notes

1. Joan Didion, *Play It As It Lays* (New York: Farrar, Straus and Giroux, 1970) pp. 15–17.
2. Joan Didion, "Bureaucrats," *The White Album* (New York: Simon & Schuster, 1979) p. 83.
3. Umberto Eco, *Foucault's Pendulum* (Great Britain: Martin Secker and Warburg, 1989) p. 222
4. Timothy Binkley, "Camera Fantasia," *Millennium Film Journal*, Nos. 20/21, 19 (Fall/Winter 1988–89).
5. Binkley [4].
6. Elsewhere, I have elaborated some other possible approaches to interactive cinema, based on my own work in the medium. See Grahame Weinbren, "In the Ocean of Streams of Story," *Millennium Film Journal*, No. 28 (Spring 1995).
7. Manuel DeLanda, in conversation, 1995.

Grahame String Weinbren has been developing an interactive cinema since 1981. His installations *The Erl King* (1983–1986, made in collaboration with Roberta Friedman) and *Sonata* (1991/93) are exhibited internationally.