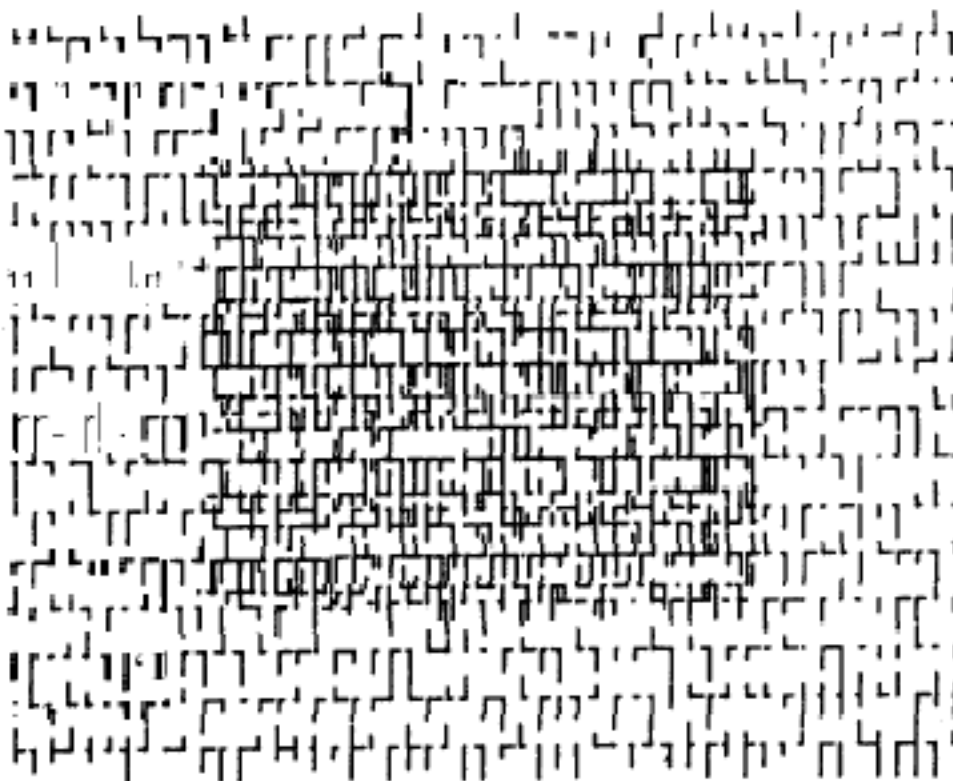


Art, Artists, and Computers



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Today, artists use the laser. So do surgeons. Today, artists use the computer. So do astronomers. Artists use new materials; so does the weapons industry. Inversely, surgeons use the pencil and paint brush, the chisel and photo camera. Astronomers play the piano. And the weapons industry makes sure that every new system looks beautiful. Does it mean that surgeons have become artists? Can astronomers and rocket engineers be called artists in the social-cultural context in which their interest in art or for some aesthetic characteristic is acknowledged? (I doubt that the artist using lasers will ever be taken for a surgeon or an astronomer or an arms manufacturer because in the social game of assuming and playing roles, this is simply impossible. We are captive to prejudices concerning the arts that go deeper than we are really willing to accept. But this is already a different subject.)

I started by raising the question of professional identity as it results from the use of technology in order to clarify that it is not the technology that makes the art, but the artist. As simple as this sounds, it is worth repeating, especially because there is quite a number of people out there hoping that the new machines will eventually replace the need for talent and work, for ideas and ideals, for sensitivity and even for sacrifice, which is a romantic prejudice of a sort, but also an impossible-to-ignore reality of the activity socially identified as art. I do not restrict the notion of

sacrifice to bread, wine or love, but include everything artists give up in order to project themselves in the work of art as they are or think they are.

But enough introduction to a subject whose introduction has been continuously written for the last 200 years, since the time the Industrial Revolution set the groundwork for the question of whether machines can be used to produce art, and even whether machines will ever produce art without the participation of artists. Today, the question is even more critical, because indeed machines can calculate without our help (or is it with our help?) and keep track of human transactions, and drive painting tools, milling machines, photo cameras. and video equipment-all tools that artists use to embody their art on canvas, in wood or marble, on sensitive paper, or on magnetic media.

In the early years of inquiry into whether computers would become a legitimate component of art and design, access to the new machine was practically a privilege of scientists and technologists. Their personal interest in a certain type of music or in certain areas of painting or design determined a particular use and the subsequent attempt to call attention to results deemed to excite artists and art students. Computer-supported choreography, computer-generated stereoscopic movies (a form close to what we can call kinetic sculpture), images manipulated through random number generators, (pseudo) four-dimensional perspective projection techniques, digital effects in sound manipulation and synthesis. All these were promising innovations. Pioneers of science and technology, in mastering the computer, did not automatically create a new breed of artist. In the long process of assimilating recently invented (and still *in status nascendi*, i.e. the invention phase) technology, traditional as well as new areas of interest were continuously investigated.

From the exotic and stimulating *Cybernetic Serendipity* exhibition in London (1968) to the impressive number of concerts, film shows and art exhibits to which the computer has contributed, many things have changed in quantity and quality. Computers have established their presence in design and architecture studios, in composers' sound synthesis laboratories and on the stage of major concert halls. Universities are integrating computers in art and design curricula. Nevertheless, A. Michael Noll, one of the first scientists to generate computer-aided artwork stated, "The use of computers in the arts has yet to produce anything approaching entirely new aesthetic experiences." This declaration makes us aware of the significance of aesthetics in computer-aided art and design.

Indeed, artists generating images with the aid of computers more often than not mimic previous works or other media. Music is frequently cold, devoid of human expression. Randomness combined with geometric structure to generate designs remains unintegrated in the final result. Such designs (used in visual communication, architecture, product design) are frequently interesting, but nothing more. Examples can be taken from so many fields where experiments involving technology and human talent are carried out. The following are among the questions often asked by technologists and artists:

- Should we agree on the idea of a fundamental dissimilarity between art and technology (seen as independent systems of human semiosis)?

- Is there something implicit in the use of computers that makes them better suited to generating geometric forms but not less-regular forms?
- Does the use of computers for emulating traditional aesthetic forms prevent investigation of forms that are unprecedented and may be impossible without computers?
- What part of our acknowledged system of aesthetic values can be applied in a computer art environment, and what part should be discarded—if only for the time being—as nonrelevant and ineffective?
- When does technology become an artistic/design tool or medium?
- What are the implications of such characteristics as interactivity, abstraction, mediation, etc. pertinent to using computers on the work produced and on its aesthetic condition?
- What is the relation between technical/ scientific creativity and aesthetic creativity?
- How do we interpret, appreciate and criticize computer-generated images?
- Will the computer be the tool through which aesthetic qualities are integrated in mass communication, mass production and mass media?

The same A. Michael Noll, apparently trying to deal with his own dissatisfaction, also stated, “In the computer, man has created not just an inanimate tool, but an intellectual and active creator partner that, when fully exploited, could be used to produce wholly new art forms and possibly new aesthetic experiences.” (*Art Ex Machina*, 1970). In this spirit, I shall address some of these questions, limiting myself to aesthetic issues.

This is not the first time in history that technology is ahead of us, although it may seem so. The realm of the possible has expanded so much since the advent of the computer that we must ask if everything possible should indeed be pursued. I am not thinking only about weapons, genetics and space exploration, but also—and perhaps primarily—about the arts. The era of modern art started with the proclamation of freedom from previous constraints. When he put a knife through a Larousse in a Zurich cabaret, Tristan Tzara not only gave the Dada movement a birth certificate, but also introduced a procedure very much in line with what computers can easily perform: storage in memory, random search and output. Tzara’s time was one of crisis, which made possible the aesthetic activity characteristic of the crisis. Not too long before that, the aesthetics of the ugly was academically sanctioned. Not too long after, we rediscovered Leonardo da Vinci’s legacy of precise aesthetics. I have to credit Max Bense and some of his best students for thoughts still unequalled in their depth and vision. I have to credit Mattyla Ghyka and Pius Servien for the same. Both anticipated Bense’s Stuttgart School of the late sixties, and our age of rationality and order. Even earlier than they, Birkhoff, a great American mathematician, understood and promoted the aesthetics of the number and mathematics.

Nevertheless, the aesthetics associated with the computer is different in nature. It regards the beauty or ugliness of logical thinking, algorithms and programming. none of which are reducible

to numbers or mathematics. The computer is in fact an intriguing but oft-times disappointing instrument of representation. Whatever the objects generated through a computer are, their aesthetics will have to account for what the aesthetics of representation is. When respected colleagues of mine from Europe and the United States declare that there is no such thing as computer art, they point out that tools do not make for art identifiers. They also point out that as a medium, the computer is rather rudimentary, unrewarding and limiting. Its output will make the fortune of the photography industry while our present concept of art will require archival quality not insured on a Cibachrome print. We adapted a technological product, which automation, information processing and data management showed to have amazing capabilities, and have done our best to force the “monster” into “drawing,” “singing” and “designing.” We knew that the hardware was not conceived for such creative work, but hoped that some programs would do the trick. To a certain extent, this has been accomplished. But if art, at least in the romantic sense we still cling to, is the expression of personality, emotion, experience and the like, then the computer does not necessarily help the artist to more freely bring it about. Quite often, what is produced on the computer can be generated more easily, quickly, and cheaply with a pencil or other traditional means. There are numerous instances in which the computer controls the artist and “signs” the work. Instead of using the machine, the artist or designer is used by it.

Should this be interpreted as a statement against computers in art? No. Is it equivalent to asserting that there is no aesthetics in works produced by using computers? Again, no. I have produced my own images, texts, sculptures and sound sequences on computers since the late sixties, so to an extent I have discovered what aesthetically relevant results can be obtained through computers and how and why. Am I a computer artist?

No. There are very few who can justify the appellation and not too many who would accept it. Some produce flying logos and other forms for commercial application and call it computer art. Once they own a computer (or a computer center) they install themselves on the pedestal to eternity and play masters to students too inexperienced to understand the difference between talent and sham. Others try performances, others painting, caricature, conceptual art, hyperrealism (with scanner!). There is nothing wrong with the experimental attitude, as long as those experimenting do not mislead anybody, do not promise more than they can deliver. As artists and scientists, we are researching a new universe in which previous art and new art come in contact. Indeed, new art forms collide with established forms, question the past, and submit new values to their beneficiaries. The new sometimes starts out disguised as the traditional, mimicking accepted models and conventions. Other times it simply suggests a totally new aesthetic code.

The use of computers is part of a social practice that has already changed our concepts, explanations and values, and will continue to do so. I personally see the computer as challenging and even changing our notion of art, questioning the concept of authorship, facilitating interaction between many participants, requiring new forms of interactivity that will lead to new forms of public participation. The implicit aesthetics is not one of hiding the limitations of the tool/medium but of transforming them into new identifiers. It is an aesthetics of technological illusion, of primitive industrial (some will say post-industrial) mentality, of consumption (and everything involved in this). But it is also an aesthetics of critical attitude, and of surrender.

I know this does not sound entirely acceptable, but the use of technology has never been a matter of simply projecting our ideals onto marble, canvas or paper, but also of learning from the process and being influenced by it. The tension between the thought, the emotion, the experience and their expression is heightened in computer-aided art because of the conflict between what is aesthetic and what is un-aesthetic, technological, scientific.

Today, technology is ahead of us, and it will be for a long time. Its aesthetic taming might prove useful not just for art's sake but also for our civilization's sake. The emerging aesthetics of our interaction with computers is characterized by an unprecedented dynamic. New forms of literacy have become necessary; some are already obsolete. Ideals, especially aesthetic ideals, which in previous civilizations were considered too visionary, if not utopian, are revived in this context.

The process does not take place on its own. It is our responsibility, and within our means, to master it, to make the best out of it. I claim that having this chance makes my generation and the next among the luckiest in history, not through what the computer makes possible, but through the aesthetic challenge of the impossible which is actually one of the strongest definitions of art one can come up with.