

# Qualitative, Dialectical and Experiential Domains of Electronic Art

*Rejane Spitz*

**T**his paper originated from the ideas I presented during the seminar "The Culture of Misery versus the Misery of Culture," which was held in August 1993 in Rio de Janeiro as part of the activities of the Brazilian national campaign "Action against Hunger and Misery and for Life." In my talk, I raised issues related to the role of electronic artists in developing countries, who produce art using new technologies within a context of extreme poverty.

I am immersed in a dualistic, clashing reality. On my way to the university where I teach computer graphics to upper- and high-middle class art students—using expensive, imported equipment in an aseptic-looking lab—I pass by undernourished children selling chewing gum by traffic lights and beggars living in subhuman conditions under highways, people who are completely excluded from all benefits of technological progress. Social welfare was once considered a consequence of economic growth. But gains in economic performance and technological advances do not necessarily lead to corresponding gains in people's general welfare, especially when these improvements are directed toward the needs of a minority. In my classes, we discuss social issues related to the advent of new technologies. Artistic and technological aspects of electronic art are seen as dependent variables that must be combined in relation to their objectives and social contexts.

A critical view and a questioning attitude are deeply rooted in my actions as a citizen of a developing nation. But the striking figures and the impressive materials on social disparities that I came across while preparing my talk for that seminar clarified my critical role as an electronic artist in a country with an accentuated social polarization, which is itself part of a world of sharp social contrast. This awareness led to a radical shift of the focus of this paper. How could I discuss the artistic potential offered by the advent of new technologies without considering the social cost of the Brazilian developmental model, where a third of the population lives in miserably poor conditions, 20 million people are illiterate and 32 million people starve to death? How could I simply talk about the aesthetics of the computer or present new trends in electronic art without considering the circumstances that surround these subjects and discussing their causes and effects? Is the role of the artist who uses emergent technologies in the Third World different from the role of those who deal with electronic art in developed nations? How can electronic artists interfere so that human, social and cultural aspects are considered in the process of the development of computer-related technologies?

For the many questions I will raise throughout this paper, I have only a few certainties. One of them is that the art factor

is not a neutral issue, but part of a socially constructed reality.

## CULTURE, TECHNOLOGY AND DEVELOPMENT

Perhaps there was once a time when people in all cultures handled relatively similar objects, needed similar skills to operate

them and used them for the same sorts of tasks. Seen from the perspective of the present day—a time when technological developments are rapidly and enormously increasing the differences between societies—this egalitarian view appears absurd and naive. Countries are now mainly categorized according to their technological stage of development, in spite of their natural resources, territories, people or cultures. The world has been divided into the First and the Third, and technology plays a decisive role in the maintenance of this segregation.

The overwhelming bulk of research and development of new technologies takes place in developed nations. Yet, developing countries require these new technologies if they are to maintain or increase their rate of economic growth. According to Raphael Kaplinsky, the resulting transfer of technology from developed to developing economies is almost always associated with a conflict of interests between the supplier and the recipient of technology. He argues that "where this conflict arises control is exerted by the more powerful party to ensure that the conflict is settled in its favor" [1]. In the case of Brazil, Andre G. Frank [2] points out that multi- or transnational monopolies control a very substantial part of the country's industry through mixed enterprises with national and state capital. He stresses the phenomenon of the "de-Brazilianization" of the economy, a process that transfers the power of decision to centers of international capital. The increase in imports of technology, equipment and intermediary inputs and services for transnational and national industries is the other side of the coin.

A wide range of instruments and mechanisms can be used by the technology supplier in order to exercise control. The

## ABSTRACT

This article draws attention to the critical role of electronic artists in the light of an examination of the differences between the First and Third Worlds. The author suggests that electronic artists are opening new venues for the use of computers as a human-centered technology by taking into account the complexity of human-machine relationships in a socio-cultural perspective. Artistic experiments are giving rise to combinations of the expressive potentials of human natural languages—which extend over aesthetic, metaphoric, artistic, affective and moral domains—and the objective, quantitative and procedural characteristics of computer-related languages. The author proposes that, in a world of social, cultural and economic disparities, the contemporary electronic artist's major struggle must be for balance between uniqueness and uniformity.

Rejane Spitz (educator, researcher, artist). Department of Arts, Pontifícia Universidade Católica do Rio de Janeiro, Rua Marquês de São Vicente 225, CEP 22453-900, Rio de Janeiro, Brazil.

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so-called modern way of living that characterizes consumer society—a model that originated in the First World—forces itself on both developed and developing countries. This model jeopardizes or, in most cases, destroys the generation of technological alternatives that differ according to the cultural, social and economic parameters of a given context. It ultimately leads to a remaking of the Third World in the image of the First. But, as Eduardo Galeano stresses, the big cities of the south of our planet are like those of the north seen through a distorting mirror: the copying effect of modernization multiplies the model's errors and defects [3].

Different groups usually invent different solutions to the same problem. In India, camels are still vastly used in many cities as a means of transportation. In Thailand, millions of mopeds have been transformed into covered three-wheeled machines known as "tuc-tuc." A sort of rickshaw pulled by a person riding a bike is another widely used means of transportation in many Asian countries. Horse coaches and ox carts are commonly seen in rural areas of Brazil. And bicycles—of all sorts, sizes and shapes—are the most popular means of transportation in China. Creativity, inventiveness, the power to adapt and the adequacy of the solution to each group's needs are the only common denominators of these devices. But cars look basically the same in India, Thailand, China and Brazil—just as they do in Europe and North America. This is not a result of the international spread of an optimum product development design that has prevailed over others because of its inherent qualities. It is a consequence of technological dominance.

But although automobiles, refrigerators, motorcycles and telephones look pretty much the same everywhere in the world, computers undoubtedly represent the most threatening example of technological and cultural dominance in our time. Computer technology's potential to transform the world into a great network of communication may be its most dangerous aspect for developing nations. The egalitarian appearance of this potential hides the fact that leadership in the development of new technologies and the design of new trends, as well as the power to spread and control these new developments, will still be restricted to a few hands. Computers are being introduced in the Third World at an exponential rate. Until now, their use in most of these countries has been con-

finned mainly to industries, offices and universities. But the scale of technological development seems set for inexorable growth. It is predicted that, in the near future, people living in the Third World will need to interface with computing devices in order to accomplish many of their daily tasks, as is already the case in developed nations. According to Nicholas Negroponte, in "the modern world" every person uses at least 12 computers a day, from fax machines to cooking equipment [4].

### COMPUTERS IN THE THIRD WORLD: THE PHENOMENON OF DOUBLE ILLITERACY

The expansion of the use of computer technology poses new problems for developing nations and forces us to reconsider the idea that technology is always a synonym for progress. This expansion affects the Third World in both cultural and economic terms. As far as cultural aspects are concerned, Brenda Laurel asks: "How [are we] to empower people from non-Western cultures to use computer technology without confining them to the Western constructs that are so deeply embedded in our interfaces, computer languages and the architecture of technology itself?" [5] In the same way that many other technologies have spread, a unique, basic computer model—uniform in terms of both hardware and software—is already spreading all over the world. Some features, such as the what-you-see-is-what-you-get forms of selection, for instance, are becoming increasingly rooted in our minds when we think of computers, in the same way that the steering wheel has become associated with our idea of an automobile. If, in essence, this basic computer model reflects the predominant logic, attitudes and views of so-called Western culture, how will this cybernetic globalization affect non-Western cultures, in terms of perception, behavior and traditions?

Michael J. Streibel stresses that the computer is an environment that is associated with many values and biases [6]. As a technology that can only manipulate explicit data and symbols according to formal, syntactic rules, the computer tends to legitimize those types of knowledge that fit into its framework and to delegitimize other types of knowledge. Epistemological methods such as interpretation, intuition, introspection and dialectical synthesis of multiple and contradictory realities are not legitimated by

computer technology. Streibel believes that computers force us to objectify ourselves as agents of prediction, calculation and control, even if we are active, constructive and intuitive in our approach to the world. He emphasizes that the more computers are used as intellectual tools, the more this process of legitimization and delegitimization takes place [7].

But it is also necessary to consider the social implications of the expansion of computer technology in the Third World. Would these countries benefit in economic terms from a replacement of the work force by computerized processes? What is the social cost of the adoption of such a model? Will it improve social welfare, or will it increase the existing gap between those who benefit from technology and the rest, for whom it is a nonexistent entity?

It is also important to note that there are different forms of use of this technology. The presence of computer technology is not always apparent to the user, but is often hidden or invisible, as is the case with microwave ovens and much sound equipment. Some computer applications allow the user to participate actively in the creation of rules, codes and meanings, while others limit the user to a set of predetermined actions. In the first case, the computer is considered an intellectual tool, but what is it in the second case? Some people will have access to the creation, development and control of computer technology, while others will have to follow—and fit into—the designs, rules and logic established by the first group. One does not have to be a visionary to predict who will be part of each group—economics, technological progress and education are interdependent variables.

Moreover, the continuing growth of the use of computer-related technologies in developing countries—where illiteracy often reaches high figures and represents a major social problem—may lead to a critical situation. Unlike other technologies, such as radio and television, which are very popular among illiterate people in these countries, computers are still highly based on written, verbal communication. So, the prospect of an increasing use of computer technology in the Third World brings the issue of computer literacy to light.

As Paulo Freire discusses in *Pedagogy of the Oppressed* [8], literacy is not a question of being able to read and write, but of being able "to say one's own word" as a culture generator. It goes beyond the ability to encode and decode abstract

meanings and focuses on the ability to create meanings within an interpretive community. It is the significance of the content of the message that counts in an intersubjective dialogue, not merely the mechanical repetition of words. One may ask, then, what "computer literacy" means. Is it related to the pressing of keys and reading of icons, or to the grasping of the underlying logic of computers as symbol-processing machines? Is it measured by the level of one's knowledge of computer devices and jargons, or by the level of one's ability to create meanings that can be shared with others within a given community?

In most developing nations, we are witnessing the advent of what can be called "double illiteracy." People who are already on the fringe because they do not share the codes of a reading and writing society are now even further outside of the system because they have not mastered the use of computers.

In Brazil, the direct interaction of the lower-income class with computer interfaces today is basically restricted to bank transactions. It is perhaps appropriate here to clarify some issues related to the extensive use of banks in Brazilian daily life. In a country where inflation reaches 30% or more a month, people cannot put their money under a mattress, but need to invest it. Saving accounts are the most popular type of investment today. The minimum amount required to open a savings account was reduced last month to Cr\$500,00 (approximately \$3 U.S.) as a result of the demands of the lower-income class. This amount corresponds to about 4% of this month's national minimum wage. The payment of most bills—such as gas, other energy and telephone bills—is also made through banks.

Credit cards are not as popular in Brazil as in other countries, and money transactions are often made with checks, which means more cash and deposit operations are necessary. Many workers receive their monthly salaries through banks, even when they earn no more than minimum wage. In summary, Brazilian banks are crowded places that are not the exclusive domains of the upper and middle classes, as they are in many other countries.

After Brazilian banks introduced magnetic cards and automatic cash machines, aiming at making the client's life easier, things have become more complex for many of their users. One can observe a high degree of difficulty when illiterate or semi-literate people interface with a computer—even when what

is required is simply entering their code number in a 12-button keyboard or pointing to an amount on a touch-screen monitor. And the impressive number of illiterate people in Brazil—20 million—does not include the millions of people that are considered semi-literate just because they can write their own names. Although even illiterate adults frequently master the use of numbers and can perform simple arithmetical operations in their daily routine—such as giving the right change at the street market, using a telephone to dial a number or choosing the right bus to catch—for some reason it seems more complex for them to deal with this new devil's machine. If interactivity is considered the core of computer-related technologies, then it is necessary to analyze the implications of an interactivity primarily based on verbal written communication in countries where a great portion of the population is illiterate or semi-literate. As a whole, this situation may be compared to the one experienced by elderly people, who also find it difficult to deal with computers. For different reasons, most elderly people may also be considered computer illiterate, in both developed and developing countries. If, on the one hand, the expressive facet of computers has been greatly improved by the advent of multimedia resources, on the other hand, computers' capability of receiving human input is still very limited. Most of the time, our emotions and ideas are funneled and restricted to the pressing of alphanumeric keys, the touching of a screen or the manipulation of a point-and-click device. Simon Penny observes that the interface is a prime concern for many artists, since it is "the place where the machine meets culture; it is the place where the machine meets the body" [9].

Given this scenario, we must ask what our responsibility is as electronic artists. How can artists interfere in this process so that human, social and cultural aspects are considered in the development of computer-related technologies? Is the role of the artist who uses emergent technologies in the Third World different from the role of those who deal with electronic art in the First World?

## DIFFERENT PERSPECTIVES

These issues encompass two different perspectives that are, however, closely related. The first concerns the governing rules of the development and implementation of computer-related technologies.

The second perspective is related to the interdisciplinary dialogue between artists and scientists. From the first perspective, it is important to consider the development of computer technology as an international issue. Operating on a global scale brings problems related to the top-down transfer of technology from First to Third World countries, and exacerbates the issue of cultural dominance. Laurel addresses the issues of access and colonialism in a discussion of the design of cyberspace environments and tools. She asks: "Should first-world white heterosexuals build little virtual terrariums for Blacks, Latinos, gays and lesbians—based on their own ideas of what such cultures are like?" [10]

Kaplinsky focuses on aspects of potential conflict in the transfer of technology. He says that any set of complex relationships between different individuals or groups is likely to lead to some misunderstanding and conflict. In the case of the transfer of technology, however, "conflict does not result merely from misunderstanding others' motives and intentions, but it is fundamentally built into the nature of the transactions" [11]. According to him, the reason is that the technology that is transferred is a primary input for the generation of surplus. "Control over this technology is thus crucial, not only because it leads to control over the generation of this surplus, but also because it is an important element in the control of the distribution of the surplus" [12].

On a national scale, the already existent gap in most developing countries between the elite and the poor is likely to increase as a result of the introduction of computer technologies. Economic growth is oriented toward the needs of a rich minority in many Third World countries, accentuating the phenomenon of social polarization. The small percentage of the population that participates in and benefits from technological advances stands in contrast to the massive number of people who are absolutely or relatively marginalized, excluded from all the benefits of technological accumulation and progress. The illiterate person from a developing country will suffer the doubly unfavorable condition of being neither a citizen of the First World—with all the technological advantages that entails—nor a part of the restricted group of Third World citizens who have access to computers and can master the logic and skills required to use them. For the disenfranchised, the introduction of computers in everyday life will be an aggression, as they will not be able to

gradually learn, master or interfere with this new technology. Yet, in the end, computers will be imposed on them.

In light of these problems, we may conclude that the introduction of computer technologies may not lead to an improved social yield in developing nations. But there is still hope.

Roger F. Malina calls contemporary artists "technology colonizers" [13] and quotes McLuhan as saying that the artist's role is to explore and spread the new environments made possible by technology. As colonizers, artists explore and establish new territories, guided by intuition, perception and sensitivity. For Stephen Wilson, the artist's most important function has been to keep watch on the cultural frontier: "Artists have cultivated sensitivities and expressive capabilities that enabled them to anticipate and interpret cultural trends. . . . They have revealed unrecognized aspects of their contemporary worlds and offered guidance toward more humanistic futures" [14]. Much, however, depends on our awareness of the actual situation, on our understanding of the frontiers and possibilities and on our participation in technological research.

This issue brings the second perspective into discussion: the interdisciplinary dialogue between artists and scientists. Although the basic approaches of these professional groups usually differ, it is misleading to segregate human actions into "art," "science" and "technology": new areas of research are emerging as a consequence of collaborations between artists and scientists. Artistic focus must be incorporated in the process of new technological developments in order for them to reach their original goal of meeting human needs and desires. As artists, we can criticize, interfere in and deviate from inadequate technological trends. When the stick is crooked, it bends to one side, and it is not enough to place it in its correct position in order to straighten it. One has to bend it in the opposite direction. This is one of the things electronic artists can do with and for emerging technological developments. Most, though not all, technologists working in isolation are far from discovering the intricacies of social and cultural issues, and their views may bend technology to its utilitarian extreme. As artists, we need to bend it to the other side by taking into account the complexity of human-machine relationships in a sociocultural perspective. As a result of these opposed and complementary views and attitudes, technology may be per-

ceived and used by the general public in its intermediate final shape, as a sum of scientific and humanistic perspectives. Human, social and technological areas of knowledge should have never been divorced, as they are complementary parts of the holistic human experience.

Penny points to the advent of a new professional identity: "the interactive media artist, an interdisciplinarian as comfortable with cultural coding as with computer code" [15]. Although only some of us have become part of this new professional group by crossing between the still segregated areas of art and technology, for Penny, the era of those who are at home with both art and technology is arriving.

One of the major challenges we face today is to create computers that have a degree of good sense and comprehension. Computers still do not recognize the user as a specific individual: the human is treated by the computer as a generic type, not as an actual person. Bork points out that, although human-computer dialogues aim at resembling interpersonal conversations, these dialogues are a form of behavioral technology in which dialogical interactions are controlled by an author who is not part of the actual interaction [16]. While interpersonal interactions have a conjoint control as their essential component, interactive computer programs only permit the user to make decisions from a predefined set of choices. For Erkki Huhtamo, "the existence of interactive systems doesn't automatically imply a democratic turn, a redistribution of power from 'the producer' to 'the consumer,' or a reorganization of the information traffic" [17].

Computers have no understanding of the information units they process. If communication channels could recognize information contents, personalized systems that could filter and generate information for a one-person audience could be developed. Darley says that if new technologies are to enable "egalitarian, more democratic, constructive forms, offering new kinds of interaction, knowledge, and understanding" [18], these possibilities have to be struggled for.

Some electronic artists seem to be engaged in this process. Artistic experiments are opening new venues for the use of computers as a human-centered technology, focusing broadly on human pleasure and satisfaction. As a result, they are gradually discovering combinations of the expressive potential of human natural language—which extend

over aesthetic, metaphoric, artistic, affective and moral domains—and the objective, quantitative and procedural characteristics of computer technology.

Yet, artists' views are not decontextualized or isolated from sociohistorical situations. Geographic, cultural, political and economic factors affect artists' perceptions and guide their actions. Electronic artists working in the First World greatly differ from those working in the Third World, not only in terms of their approaches and resources, but mainly in terms of their access to computer-related technology developers.

The diverse realities in which electronic artists are immersed tend to direct their focus into different concerns. While many electronic artists in developing nations are increasingly discussing basic issues such as human rights, social injustice, misery and hunger—which are at the core of their daily struggle for the improvement of their living conditions—these issues are not commonly debated in art conferences in the First World. But if, on the one hand, artists from the First World see Third World critical problems from an outside perspective, on the other hand, First World artists may be insiders when it comes to many decisions that will deeply affect the quality of life in developing nations.

In terms of access, electronic artists in the First World can interfere in a more direct way than their colleagues in the Third World, as they have more opportunities to take part in the development of new trends in computer-related technologies. Although such opportunities are still restricted to a small group of artists even in the First World, the chances for artists from developed countries to research, interfere with and collaborate on computer-related technological developments are remarkably greater than the chances for those who live in developing countries to participate in such capacities.

## ARTISTS AS TECHNOLOGY COLONIZERS: POSSIBLE ACTIONS

But—in both the First and the Third Worlds—what can we electronic artists actually do, as technology colonizers? Laurel suggests the construction of convivial tools—"tools which give each person who uses them the greatest opportunity to enrich the environment with the fruits of his or her vision" [19]. She says: "I believe that our strategy should be to

collaborate with native people in other cultures to build a core of technological expertise. Empowered indigenous programmers will strap themselves to their own user-communities and commence the processes of understanding and ultimately, expropriation." But, in light of the issues discussed earlier, one may guess that the "empowered indigenous programmers" might be trapped in an intricate net of international and national political and economic interests, and may not go too far.

From Henry See's point of view, this discussion gives rise to some crucial questions: "Is the role of the artist to improve the technology so that the established economic/political order can use this technology better? Is improving the technology the answer or is it changing the system which produces it? Can you change the system by changing the technology? Is the role of the artist to change the system?" [20]

The answer to these questions possibly resides in a combination of long- and short-term actions. Electronic artists must have both a worldwide perspective and a critical view of the social implications of the development and use of electronic technologies. It is our responsibility as citizens of this planet to contribute to the improvement of the quality of life on earth in every sense. Neutrality does not exist. A political view is embedded in every person's action or thought. A careful and deep consideration of social and cultural issues may certainly lead to improvements that will make new technologies more appropriate to their users' needs and desires. It is definitely a long way, but it begins with the first step.

In the short-term, much can be done with simple actions. The exchange of information and experiences is a good start. Issues such as the one I am presenting now may be a way of introducing a new challenge for electronic artists. In this sense, the Fourth International Symposium on Electronic Art (FISEA) became a very important forum for such discussions, as a symposium where electronic artists from different countries

and continents exchanged their views during several days of intense debates. At the Third International Symposium on Electronic Art (TISEA), in Australia, very important issues on cultural diversity were raised, and I do believe that, as a result, many of us today are listening to each other with less ethnocentric views. Different groups' approaches and perspectives should serve as inputs for new trends in the development of computer-related technologies.

Many of us who are also involved in teaching have a responsibility to introduce sociocultural aspects as part of the discussion of art-related issues. We must open our students' minds and hearts to a broad understanding of our social role.

Another issue concerns participation. In my activities as the Inter-Society on the Electronic Arts (ISEA) South American Representative, I have realized the great interest that South American artists have in talking to the universe, the great desire we have to exchange our thoughts and practices with the rest of the world and the need we have to question our similarities and point to our differences. Formal and informal associations may be a good conduit for funneling individual energy into more effective and productive collective actions.

It is our role to lead computer technology into an era of new values concerning cultural issues, as part of the interactive dialogue between humans and machines. Artists and technologists from the First and the Third Worlds should join their different perceptions and knowledge in order to enable the construction of a qualitative, dialectical, experiential and expressive electronic language.

The time is right for the adoption of such an approach. The main challenge of this decade is to establish a socio-technical commitment capable of addressing problems of both local and global scope. In a world of social, cultural and economic disparities, a balance between uniqueness and uniformity must be the object of the contemporary electronic artists' major struggle. Better times may be on the way.

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## References and Notes

1. Raphael Kaplinsky, "Accumulation and the Transfer of Technology: Issues of Conflict and Mechanism for the Exercise of Control," *World Development* 4, No. 3, 197-224 (1976).
2. Andre G. Frank, *Crisis: In the Third World* (London: Heinemann, 1981) p. 11.
3. Eduardo Galeano, *Ser como Eles* (Rio de Janeiro: Editora Revan, 1993) p. 15.
4. Nicholas Negroponte, "Como por o mundo em nossos eixos," interview with Herb Brody, *O Globo/Caderno de Informatica* (31 May 1993) p. 18.
5. Brenda Laurel, "Global Media, Common Ground, and Cultural Diversity: Cultural Diversity in the Global Village," *TISEA Proceedings* (Sydney: ANAT, 1992) p. 92.
6. Michael J. Streibel, "A Critical Analysis of the Use of Computers in Education," *ECTJ* 34, No. 3, 137 (1986).
7. Streibel [6] p. 154.
8. Paulo Freire, *Pedagogia do oprimido* (Rio de Janeiro: Paz e Terra, 1979) p. 7.
9. Simon Penny, "Machine Culture: The Virtual Frontier," *ACM SIGGRAPH '93 Computer Graphics Visual Proceedings* (New York: ACM, 1993) p. 111.
10. Laurel [5] p. 91.
11. Kaplinsky [1] p. 197.
12. Kaplinsky [1] p. 198.
13. Roger F. Malina, "Computer Art in the Context of the Journal LEONARDO," *Computer Art in Context*, SIGGRAPH '89 Art Show Catalog, Supplemental Issue of *Leonardo* (1989) p. 67.
14. Stephen Wilson, "Artists as Explorers of the Technological Frontier," *Academic Computing* 2, No. 1, 32 (1987).
15. Penny [9] p. 111.
16. Cited in Streibel [6] p. 149.
17. Erkki Huhtamo, "It Is Interactive—But Is It Art?" *ACM SIGGRAPH '93 Computer Graphics Visual Proceedings* (New York: ACM, 1993) p. 133.
18. Cited in Huhtamo [17] p. 135.
19. Laurel [5] p. 92.
20. Henry See, private correspondence, October 1993.