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***BY PEDRO BARBOSA, ANA  
HATHERLY, AND E.M. DE  
MELO E CASTRO***

***EDITED BY  
RUI TORRES  
AND SANDY BALDWIN***

Computing Literature, the Center for Literary Computing, Morgantown, WV 26506

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# TOWARDS A THEORY OF COMPUTER GENERATED TEXT<sup>123</sup>

## *EXECUTIVE COMPUTER AND CREATIVE COMPUTER*

### *PEDRO BARBOSA*

#### 1. Technique and Discursivity

One of the great contemporary mutations is no doubt the installed symbiosis between two realms once considered irreconcilable: technique and logos, technique and discourse, or technique and language. Since the beginning of the technological revolution, such symbiosis has increased: just consider the new means of recording and communication that stem from new technologies (from photography to the cinema, from radio to television, from video to holography). In a fully electronic age, such interdependence between technique and discourse is already so intimate that sometimes it is hard to distinguish where the language domain ends and where its supporting means of record or transmission begins.

Finally, with the most recent trends of the so-called computing revolution, a new symbiosis is dawning—not only between technique and discourse but also between technology and creativity. This symbiosis follows scientific experimentation and modeling towards the development of Artificial Intelligence through computer generated art, the recently coined Infoart, as well as other recent developments.

It is with this scenario of new theoretical and practical problems raised by the recent alliance between technology and creativity that we propose to unveil some of the curtains that hide them. Yet, in such a vast field of relations, we will circumscribe our analysis to the specific scope of the symbiosis between computer and Art, addressing in the first place its more restrict application to Literature.

Adriano Duarte Rodrigues wrote the following about what he called the “logotechnical dimension” of present communication:

The recent access of technicity onto the sphere considered until a few decades non-technical, to the sphere of language, with the establish-

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123 Pedro Barbosa, “Esboço de uma teoria do texto computacional,” from *A Ciberliteratura: Criação Literária e Computador*, 1996, pp. 25-36. Translation by Isabel Basto.

ment of the so-called logo-techniques radically alters this notion: from limit, technique is about to become the very way of achieving the communicational process (91–95).<sup>124</sup>

Currently, we have overcome the radical dichotomy between techno-phobia and techno-philia that had sometimes split the waters of the old humanist conception of culture, and, therefore, the traditional cleavage between the world of logos and the world of *tékne* gave way to their respective interpenetration.

In fact, writing was already, by itself, the first technology to register thought and oral speech. Also, in a remote past, writing was targeted by objections similar to the ones common sense now raises regarding computers. Actually, in the *Phaedrus*, Socrates despised writing. He saw in it a spurious materialization of living thought that seemed to mummify and depersonalize; however, Plato expressed this viewpoint in a written book. As a matter of fact, in the transition from oral cultures to written cultures, this rudimentary technology was sometimes regarded with suspicion, as it seemed to solidify the living thought of the oral word, dehumanizing and exteriorizing it into fixed immobility.

Hence, the notion of *logotechnia* insinuates a new synthesis verified today between the order of speech and the order of technology. This way, language—that somewhat outdated tradition the radically technophobic reserves as hunting grounds private to man—finds itself henceforth irreversibly penetrated by technical instrumentality. The computer and the informatics age—which presently appears to us as the summit of the electronic revolution—sharpened this situation. Where radio and television once appeared as simple transmitters and passive diffusers of speech, now the computer appears as a manipulator and active transformer of language, even a semantically creative instrument that promotes new meanings and new semiotic re-combinations.

## 2. From Creative Computer to Executive Computer

We will limit our reflection to the scope of computer generated literary creation, excluding the domain of simple text processing widely used today, in which the

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124 O.P.: “O recente acesso da tecnicidade à esfera até há poucas décadas considerada como não técnica, à esfera da linguagem, com a constituição das chamadas logotécnicas, altera radicalmente esta concepção: de limite, a técnica está em vias de passar a ser o próprio modo de realização do processo comunicacional.”

computer does not play a creative role, but merely an executive one. A text processing code does not simulate the writer's work, but merely the dactylographer's or the typographer's work. Let us say, in this case, that the machine works above all as a mechanical extension of the creator. Still, text processors do have an increasing impact on our methods of writing and, therefore, lead to a predictable aesthetic evolution of literature.

Text processing is for the writer what graphic computing or CAD (Computer Aided Drawing) is for the plastic artist: a means of execution, rather than a means of creation. It is nothing more than what might have been named computer aided handwriting.

This does not intend to undermine the reciprocal influence that means of recording and transmission has upon creative work. It is commonly accepted that the literary style at the time of the quill pen and inkwell, with its mandatory interruptions, is widely different from the more cursive literary style from the age of the roller ball or permanent ink pen. We can also distinguish the impact of the typing machine in literary evolution, working as a filter over-emphasizing the two-dimensionality of the plane surface of the piece of paper, in detriment of the more fluid unidirectionality of the hand written line (much of the visual poetry is there to prove it). Recalling McLuhan, the medium is also the message.

As a matter of fact, any new writing technology ends up influencing the stylistic evolution of literature to some extent.

Many writers have already adopted the computerized processing of their texts. Therefore, the interactive dialogue with the screen makes the so-called electronic writing a radically different experience than before with the mechanical exercise of the traditional typewriter. Instead of having to mentally design the setting of his text in order to subsequently reproduce it on paper, computerized processing allows the writer the freedom to write in any order, to introduce new ideas whenever they occur, to assess the effect of the sentences on the screen, and to make and remake the already written text until the intended final result.

Through this interactive writing, most of the times without paper, the text seems to happen firstly on screen and to reflect itself afterwards in our mind. The dialogue—the self-dialogue between our mind and the screen (as is happening to us this precise moment)—transforms the writing task in an enfolding process of reading/writing.

Electronic writing hence places the writer *viz-à-viz* with the screen in a dialoguing and interactive position towards his/her own text. Furthermore, with the ability to memorize and self-correct, this will make the simple introduction of the executive computer in the realm of writing to, sooner or later, cause an inevitable stylistic effect.

A thorough analysis of the impact of the recent text editors on techniques of writing is beyond the scope of the current work. And, we know well how this paper-free writing may directly be transferred via modem or disk to the editor or newspaper office. This fact alone alters the writer's and reporter's relationship with words, which acquire a new texture—quasi-immaterial—once they can transcend their secular paper mediation.

However, the position of the writer regarding the text processor does not differ greatly from that of the plastic artist, who chooses the electronic palette instead of paint and brushes and, with a simple gesture of the hand, electronically materializes on screen or any other physical medium (paper, photography, video) the image previously elaborated by his/her brain.

It is interesting to note the two major stages in the path of computer use in visual arts. In the first stage, at the time of large computers of second and third generation, computational art was essentially mathematical and programmed from pure abstract formulas. It was, for the most part, combinatory, geometrical, non-figurative, and abstractionist. The computer was then regarded as a conceptual machine, a truly creative instrument, with the starting point being algebraic formulas and the outcome being pure image synthesis.

The second phase corresponds to the so-called fourth generation age of microprocessors—whose widespread use during the 1980s dragged along a parallel market of software directed to the common user, the non-specialist. Computer art curiously approached the most spontaneous human gesture. By using the mouse or the digital pen as a brush and the screen as a paint palette, the direct interaction artist/machine henceforth easily allowed the digital painter to register, correct, or erase the gesture of his hand, providing the production of images both in an abstract direction and in a figurative direction. The computer is then used by the plastic artist as a simple tool for manual execution, lending her/him a menu with prefabricated visual effects (colors, traces, curves, symmetries, shadows, reflections, transparencies, perspective, animation, etc.), and inclusively

allowing the combination of the digital treatment of pure images internally generated by the computer with real images from an outside source.

A similar qualitative leap could also be noted in computer generated music, which seems to have evaded the sphere of musical composition to aim preferably at the execution phase. In fact, while over thirty years ago primitive electronic music strove to synthesize entirely new worlds of sound in the initiating space of large specialized studios, today we witness synthesizers' mass marketing, as well as music composition and notation software already filled with endless standard effects for direct and immediate simple execution.

In the realm of the word (even if at a much smaller scale), computer use would also go through those two same stages, corresponding to two entirely distinct operative concepts: the concept of creative-computer and of tool-computer.

The idea of creative computer corresponds to a longing that was nursed during the 1960's and 1970's when the mythical dinosaur computers, then used in large labs only, were more distant and more inaccessible to the regular user. But, perhaps precisely because of that, the artist surrounded himself (when the circumstances allowed) with computing specialists to elaborate their programs, adjusting them to their particular purposes.

Paradoxically, the big bang of microcomputers in the 1980's made them affordable to the general public and gave rise to a parallel software market with a finished product: an authentic prêt-à-porter that transforms the computer into a simple prefabricated tool whose use is depersonalized, massified, and standardized. We then witness this curious effect: in terms of hardware, the computer finds its way into everyone's home, but, in terms of software, the artist will be further distanced from the direct programming of the machine, only using standardized software from the market. The age of the so-called personal computer is now just a mirage: the more massified individual computing gets, the more depersonalized it becomes, regarding the particular purposes of the common user.

It is to this precise context of passing from a creative-computer onto a tool-computer that we enter the wave of text processing software, usually embedded in each and every PC or laptop at the very act of purchase. The repercussions of the computerized processor will nevertheless happen chiefly at the level of the structure of text surface, its support, and its mediation. Based on this, we will, in the following section, exclusively focus on the computer constructed as a creative tool.

### 3. The Creative Computer and its Scope

But, is it legitimate to mention a creative computer?

In order to avoid equivocal expressions, we will refer to the creative use of the computer. But what does this mean? We will focus only on what has already been called Artificial Imagination—an expression no less ambiguous, although that seems suggestive when used in the metaphorical sense—to establish a connection between the arts and the already consecrated expression of Artificial Intelligence.

We shall then define computer as a machine that manipulates signs at great speed, according to certain rules contained in the software. Its main advantages are: the possibility to keep a huge amount of data in storage and the processing precision and speed. In this sense, it may be construed as an extension of human intellectual work (a machine, actually, is always the extension of any sector of human activity); and hence it allows the scientist, as well as the artist, to perform more complex operations than he/she would be able to perform without this new technological prosthesis.

We may consensually define the computer as a machine able to perform operations on symbols (placing us at the abstract level of programming). We are also implying—with no useless debate over its intelligence—that this machine per se seems focused on performing good service to the artist. Like the artist, the computer works with symbols and rules of order.

We may otherwise abstractly define artistic language as a set of operations performed with certain symbols. Of course, if we intended to be more precise regarding the concept of work of art, we might define it temporarily as each and every artifact able to produce an aesthetic effect. Despite the tautology, we will not yet approach the concept of aesthetic effect. We will just focus on what the general intuition understands of this expression. Yet, we would like to exclude from this notion the usual etymological concept, mostly after the Romantics, that identifies aesthetic effect with feeling or any exclusive form of sensitivity (aesthesis). There may be, as is the case for much of modern art, aesthetic products not directly aiming at the sensitive or emotional component of the receiver, but rather his/her rational and conceptual component, remaining nevertheless art.



With these two previous definitions (of computer and art) synthetically established, we may now restate the issue of computer generated art with less ambiguity: is such art possible?

It has often been stated that this question is based on an intrinsic incompatibility and constitutes a contradiction in terms. It is said that computer generated art is not possible because the machine has not and can never have aesthetic sensitivity. Obviously, this is equivalent to shooting an arrow away from the targeted issue and only indicates, regarding who poses that question, ignorance on how a computer operates.

Firstly, such a statement derives from an abusive identification, or at least a very restrictive one, between art and a certain form of the so-called aesthetic sensibility (already revealed by structuralism to lack purpose). Secondly, it is not the machine (the material, hardware) that will produce whatever per se might be, but rather the software (programs, applications) running on it.

The issue is really quite different and requires a different formulation. Let us then ask: is it possible to use the computer to execute programs with artistic potential? More specifically: When a computer develops and updates the combinatorial, structural, or other possibilities made available through a given potential algorithm (as is the case of combinatory algorithms), can we deny that the machine creates or at least updates something that at first did not exist? Or that existed merely in a latent state? And, in such case, is it legitimate (as exemplified afterwards) to name such programs creative programs? Meaning they possess generative potential?

Within these parameters, we find it pertinent to discuss the issue of the creative computer or, if preferred, of the creative use of the computer. Undoubtedly, when we mention computer generation we cannot ignore that the human being created the machine, as well as the program. The generative abilities of the program, or of the machine, will ultimately owe authorial rights to human beings and not to the machine...

Additionally, on the side of the process, it is also a human being who is presented as the end addressee of the meaning of the computer-generated messages. As a consequence, it matters little that the machine's manipulations of formal symbols are devoid of meaning: the symbols inside the machine have no symbolic properties. They hold syntax, not semantics. Intentionality and signification of what the computers seem to produce is merely in the mind of those elaborating

the program (those providing the input) or alternatively of those interpreting the results (those receiving the output).

For these reasons, it seems irrelevant to question whether the machine (or the program) may or may not understand what it does or if it does or does not have consciousness of what it generates. It is an irrelevant issue, not to say absurd, for the machine does not need to apprehend the meaning of what it does in order to do it. Such apprehension of meaning will be undertaken by the human end user, and it will only make sense when made by him. In order to be creative, the machine does not need to be intelligent. It is enough that it manipulates structures of signs that enhance the aesthetic effect (as before defined) and that such an effect (output) is not at first entirely configured in the data or in the program (input).

Exploring a field of open possibilities, the machine simply generates (updates) one or several states of possible works, which were actually inexistent at first despite having already been potentially embedded in the program.

Computing, therefore, brings onto the realm of Art the notion of germination power (for those preferring this denomination to creative power): and if we cannot say the seed is already the fully grown tree (it may never become a tree at all), we cannot deny that it potentially contains the whole future tree. And so, the notion of potential text (or virtual text) as materially open text is construed only in the form of project, not preexisting as such.

This marks the limits of our reflection.

We will focus on the application of the computer to Literature through programming potentially creative algorithms, and this new literary genre shall be provisionally named Computational Literature or InfoLiterature.