

# Emergence of (Experimental) Computer Art in Brazil: Pioneers and Events

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### Abstract

This article introduces the emergence of (Experimental) Computer Art in Brazil, nominating pioneer artists and events, its historic contextualization and some of its developments. This art form, immanently connected to computers, emphasizes sensory, poetic and aesthetic experiences intermediated by computational/electronic devices with the capability to process and answer requests, being also the artworks support/media. It is an art focused on the trilogy: artists, computers and public. Taking as reference the Art Institute at the University of Brasilia, Brazil, which promoted Computer Art courses and exhibitions, since 1987, we here describe and illustrate different exhibition spaces for innovative artworks. These experiments originated a series of meetings and exhibitions culminating at the  $\geq 4D$  (Either greater or equal to 4D) exhibition in 2004, giving birth to the EmMeio exhibitions that followed until today.

### Keywords

Computer Art,  $\geq 4D$  (Either Greater or Equal to 4D), Experimental Art, University of Brasilia (Brazil)

### Introduction: Historical Contextualization

In Brazil, around the year 1987, a small group of artists and scientists named Infoesthetica Group began to explore an art form that was emerging at the time, in which sensory, poetic and aesthetic experiences would be intermediated by computers. This group was formed by Aloisio Arcela, Bia Medeiros, Homero Picollo (software creator), Paulo Fogaça, Suzete Venturelli and Tania Fraga (Figure 01). These computers act as devices with the capability to respond to procedures, such as processing and answering interactors requests, and, at the same time, being the art-works support/media. Such procedures characterized the artworks proposed at this time in very specific ways, and required from the artists programming knowledge to break the codes (Diamond, 2008). Their main goal was not the development and research on computer science algorithms but to acquire this type of knowledge in order to create meaningful

sensory, poetic and aesthetic environments with it. Such art was referred to, at that time, as Numeric Computer Art or Cybernetic Art.

The Brazilian group did not come up with those terms or definitions. It was already in use promoted by artists such as Bernard Caillaud (France), Waldemar Cordeiro (Brazil), Yoshiro Kawaguchi (Japan) Paul Brown (UK), Hebert Franke (Germany), Nicholas Schoeffler (Hungary), John Whitney (USA), Lilian Schwartz (USA), Frieder Nake (Germany), to quote just a few. Theoreticians such as Arlindo Machado (Brazil), Lúcia Santaella (Brazil), Vilém Flusser (Czechoslovakia-Brazil), Philippe Queau (France), Edmund Couchot (France), Roy Ascott (UK), among others, also had already written about this emergent art form.

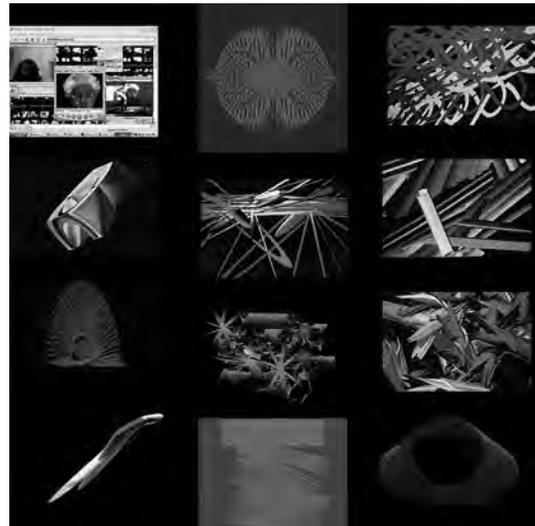


Figure 1 Images by Aloisio Arcela, Bia Medeiros, Paulo Fogaça, Suzete Venturelli and Tania Fraga

It is also important to point to, that Brazilian computer artists have suffered strong influence of the Brazilian theoreticians quoted above – mainly the art critique and curator Arlindo Machado, the semiotician Lúcia Santaella, and the Czecho-Brazilian media philosopher Vilém Flusser—who have been instigating artists about the experimental potential of computer technologies. Flusser lived in Sao Paulo for 30 years. His articles inquired about the role of artists and philosophers in post industrial age in contemporary society pointing to the possibilities for technical objects (he used the expression technical images) to become “carriers of meaning” and the transformation of “people into designers of meaning in a particular process” (Flusser, 2002).

In this paper we assume the term **Computer Art** to determine the specific artistic production in discussion. We consider such art as immanently connected to computers. It is also important to state that “experimental art has had a

The pioneer artist Waldemar Cordeiro began to use computers in visual arts in Brazil by the end of the 60’s (Cordeiro, 1986b). He was part of the Ruptura and the Concrete Art Poetry Groups in Sao Paulo (Cordeiro, 2016). In 1971, he showed his computer artworks at the exhibition *Arteônica* (Cordeiro, 1986c) and presented a manifest with the same name influencing many Brazilian artists since then. He said on that occasion that “in Brazil Computer Art found methodological background in Concrete Art” (Cordeiro, 1986a). In 1972, he created the *Arteônica Center* at the Art Institute of the University of Campinas, UNICAMP, which has had a pioneer role for the development of algorithmic art research for image generation in Brazil (Amaral, Pignatari and Restany, 1986).

In 1994, after much struggle, these ideas begun to be more generally accepted by the Brazilian art community and the first Brazilian art graduation program, focusing these issues, was created at the Art Institute of the University of Brasilia, in Brasilia. Other artists such as Gilberto Prado, André Parente, Milton Sogabe and Diana Domingues also accepted the challenge and a few years later were also coordinating Computer Art projects at Sao Paulo, Rio de Janeiro and Rio Grande do Sul.

In 1995 Domingues curated the exhibition *Art of XXI Century* at the Museum of Contemporary Art of the University of Sao Paulo and, in 1999, a Mercosul Biennial section, in Rio Grande do Sul. In 1996, Fraga organized the first online Internet exhibition for the International Visual Semiotics Congress held at Sao Paulo Catholic

University, PUC-SP. In 1997 Bousso curated the exhibition *Mediações* at Itau Cultural Institute aiming to “take out art from its conceptual towers and from the ascetic modern domain in order to allow it to dialogue with the public” (Bousso, 1997). Latter on, as director of the Museum of Image and Sound she created the first Brazilian media lab and instituted, for the first time in Brazil, an artist-in-Residence program for young artists.

Since 1997, the Brazilian Itau Cultural Institute has had a leading role in the field of art and technology. It has been showing and awarding artists and has promoted very important international art and technology biennial strong role in Brazil maybe because the art market did not offer significant possibilities for artists that did not follow the current paradigms. Some of these experimental artists were so radical that they were, during their life, strongly reject by the mainstream Western art. For example, the today incensed artist Lygia Clark was almost expunged from Sorbonne, in France, in the 70’s, because she dared to experiment with visceral body sensations and feelings using ordinary materials such as onions skins, pebbles, plastic bags, among others, having the participants bodies as supports for her work” (Fraga, 2012a).

exhibitions named *Artificial Emotion*. Many artists quoted in this article have won awards and commissions from this institute.

A second generation of artists, working with art and technology, was rising around the years 1996-2008: Anna Barros (in memorial), Carlos Praude, Cleomar Rocha, Carlota Brito, Daniela Kutschat, Douglas de Paula, Dulcimira Capissani (in memorial), Edgar Franco, Eufrasio Prates, Flávia Amadeu, Francisco Marinho, Guto Nóbrega, Gisele Beilgman, Ivani Santana, Kátia Maciel, Lucas Bambozzi, Lúcia Leão, Luisa Paraguai, Luiz Duva, Lygia Saboia (in memorial), Marcos Bastos, Maria Luiza (Malu) Fragoso, Martha Gabriel, Milton Sogabe, Raquel Kogan, Raquel Zuanon, Rejane Cantoni, Rosangela Leote, Sandro Canavezzi, Sílvia Laurentis, Simone Michelin, Valseli Sampaio, Wilton Azevedo, among many others. Many of them are not code breakers (Diamond, 2008). They explore computer systems hiring programmers to set up their concepts in Computer Art.

Theoreticians Priscila Arantes and Monica Tavares, Art Historian Nara Cristina Santos, curators Francielle Filipini, Wagner Barja, Paula Perissinoto, dance curator Maira Spangero, following Machado, Bousso and

Santaella leadership, have begun to investigate this specific type of art. Consequently, at the University of Brasilia, what used to be a small biannual meeting was transformed in an annual International Congress always held with a Computer Art exhibition (Fraga, 2012).

### 2004: A Turning Point

In 2004, during one of the annual congresses quoted above, the exhibition  $\geq 4D$  (*Greater or Equal to 4D*) was held at Bank of Brazil's Cultural Center in Brasilia. For that occasion Tania Fraga and Wagner Barja curated the show and Fraga introduced the concept of metainstallation. The focus of almost of all works was interactivity. The idea was to create space-time dialogues among these artworks, and not a set of separated independent installations. The meta-installation project for  $\geq 4D$  not only gave an organic coherence to the exhibition's space but integrated the art pieces exploring their poetic proposal. The architecture of the  $\geq 4D$  exhibition was conceived mirroring virtual reality technology navigation's models. "The meta-installation consisted of works by artists and researchers working mostly with this type of art. These works breach the architectural space-time structure, creating tunnels of events that allow the public to dive into their content; they ensure the non-linear nature of the routes through the meta-installation, reconfiguring the architectural space of the galleries, redirecting the gaze and the modes of perception of those moving through it. Lightness and fluidity create conditions for apprehending ineffable, imponderable and transitory feelings prompted by time fluctuations in the various works" (Barja and Fraga, 2004).

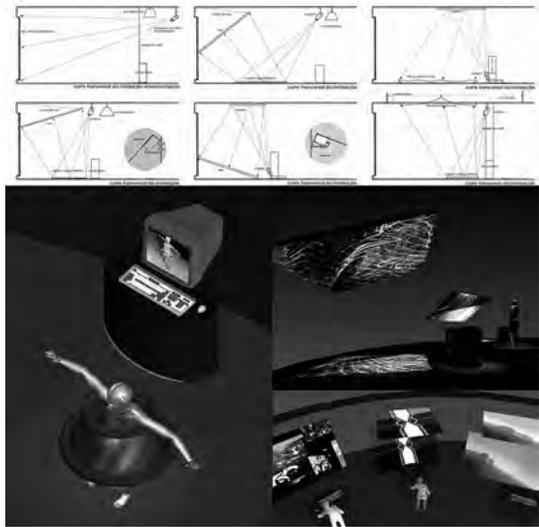


Figure 2 Exhibition  $\geq 4D$ , Simulation of exhibition and the schematic distribution of six different artworks

Therefore, the structural organization of the exhibition environment was designed to stretch the concept of installation, generally used for contemporary works of art, where each artist produces and organizes his or her micro space individually. This organization aimed to unveil the significant aspects that were being transcodified into sensations, which could be felt and shared. "In general, the works on display cluster images, sounds, tactile sensations and movements, as the outcome of collaborative processes among the artist, the public, the machines and the many minds whose intelligence is embedded in them", Figure 02. Human and artificial intelligence were united to create within the exhibition spaces a symbiotic communion among interactors' mind, the artists and the machines that run the software. The exhibition was held in two galleries.

The "tunnels of events in the upper gallery wander through fields of possibilities contained within the synthesis of images, sounds, abstract concepts, tactile sensations and possible isomorphisms among these categories. The works use computer languages to turn numerical codes into feelings and sensations. The lower gallery offers a hybrid field where images of synthesis and material culture blend, breaking through the barriers of what is normally called the real" (Barja and Fraga, 2004).

The setting of virtual objects and the 'existence' of virtual worlds emerge from the sense impressions they produce as subjective sensations since the perceptions result from illusions. These subjective sensations are nothing more than mental connections. Maybe these connections are the bond that entwines mathematics and art. The sense experience the interactor experiments and its subjective sensations are facts leaving one generally in awe. The comprehension of this emerging sensory order, as the result of numeric relations and functions, is a mystery we may never understand.



Figure 3 Exhibition  $\geq 4D$  different artworks

The artists at this exhibition were: Bia Medeiros, Chico Marinho, Daniela Kutschat and Rejane Cantoni, Diana Domingues, Gilberto Prado, Luisa Paraguai (who created *Vestis* the first wearable computer created in Brazil), Lygia Sabóia (in memorial), Margarita Schultz (curator presenting the work of a collaborative Latin America art group, The Colaborarte Group), Maria Luiza (Malu) Fragoso, Silvio Zamboni, Suzete Venturelli and Tania Fraga. These artists stand out for their excitingly innovative and original proposals, mainly in terms of exploring the potential of computer languages, extracting and deploying new poetics from them. By showcasing this type of production this exhibition showed appreciation for the pioneers who faced unimaginable difficulties in developing their output, placing Brazil and Brasilia in a leading position

within the international stage. In Figures 03 and 04, a sequence of images of the  $\geq 4D$  artworks.

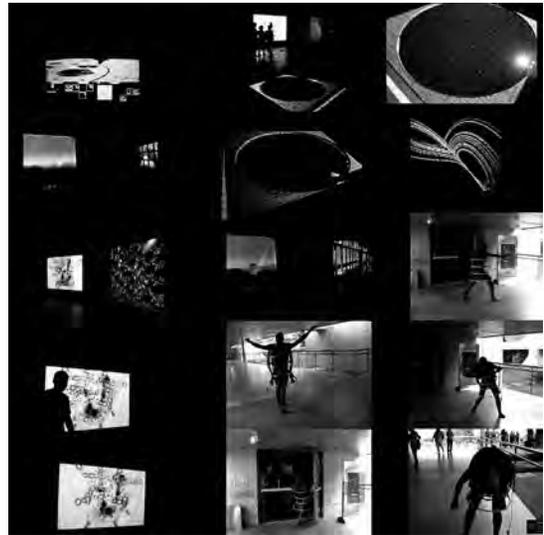


Figure 4 Exhibition  $\geq 4D$  different artworks

Obviously, the skill resulting from manipulating computer languages transcoded into feelings and sensations is still very limited (Picard, 2000). Brazil may play a leading role in this field due to the rapidity with which Brazilian society has been absorbing the changes prompted by the development of computer technologies. Brazilian artists have been challenged by theoreticians to develop new identities for a society which desires development and access to technologies and the benefits they bring to contemporary life. Computer Art may become one of the answers for these quests.

## Conclusion

As it was said before, the University of Brasilia was a pioneer in developing research projects in Computer Art. Its Master of Arts degree was one of the first art courses in Brazil to discuss and focus on these issues and an undergraduate bachelor degree in Computer Art is in discussion. This type of research answers to the commitment that guided the establishment of Brasilia as a hub of contemporary values, appreciating the blend of Brazilian culture with the arts, while fostering an integrated development. Summing up, we mention the paper under the title '21<sup>st</sup> Century Brazilian Computer

(Experimental) Art' that gives sequence to this historical review from 2004 until the present days referring to the *EmMeio* exhibitions (Figure 05) held at the National Museum of the Republic, promoted by the University of Brasília

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Figure 5 Exhibitions EmMeio and EmMeio#2

### References

- Amaral, Aracy, Belluzo, A. M., Pignatari, Décio and Restany, Pierre. (1986). *Waldemar Cordeiro: uma aventura da razão*. Sao Paulo: MAC-USP.
- Barja, Wagner and Fraga, Tania. (2004). *Wanderings. >=4D: Arte Computacional Interativa*. Brasília: Bank of Brazil Cultural Centre (catalogue).
- \_\_\_\_\_. (2005). >=4D [Maior ou igual a 4D] >=4D: *Arte computacional no Brasil*. 143- 146. Brasília: Universidade de Brasília
- Bouso, Daniela. (1997). *Exposição Mediações*. Sao Paulo: Itau Cultural Institute (catalogue)
- Cordeiro, Waldemar. (1986). *O projeto construtivo na arte. Waldemar Cordeiro: uma aventura da razão*. 75-75. Sao Paulo: MAC-USP.
- Cordeiro, Waldemar. (2016). Retrieved from: [http://images.google.com.br/images?hl=pt-BR&q=Waldemar+Cordeiro&um=1&ie=UTF-8&ei=G Dj C S qPHsSnuAfOhpzVBg&sa=X&oi=image\\_result\\_group&ct=title&resnum=1&ved=0CBQQsAQwAA](http://images.google.com.br/images?hl=pt-BR&q=Waldemar+Cordeiro&um=1&ie=UTF-8&ei=G Dj C S qPHsSnuAfOhpzVBg&sa=X&oi=image_result_group&ct=title&resnum=1&ved=0CBQQsAQwAA) [http://www.itaucultural.org.br/aplicexternas/enciclopedia\\_ic/index.cfm?fuseaction=artistas\\_biografia&cd\\_verbete=3529](http://www.itaucultural.org.br/aplicexternas/enciclopedia_ic/index.cfm?fuseaction=artistas_biografia&cd_verbete=3529) <http://www.mac.usp.br/mac/templates/projetos/seculoxx/modulo3/ruptura/cordeiro/bio.html> [http://www.acervos.art.br/gv/artistas\\_brasileiros/bio\\_wcordeiro.php](http://www.acervos.art.br/gv/artistas_brasileiros/bio_wcordeiro.php) Accessed November 15<sup>th</sup> 2016
- Diamond, Sara. (2008). Reframing the cathedral: opening the sources of technologies and cultural assumptions. *Critical digital studies*. 56-70 Toronto: University of Toronto Press.
- \_\_\_\_\_. (1986a). Arte concreta e o mundo exterior. *Waldemar Cordeiro: uma aventura da razão*. 107. Sao Paulo: MAC-USP.
- \_\_\_\_\_. (1986b). Computer plotter art. *Waldemar Cordeiro: uma aventura da razão*. 145-160. Sao Paulo: MAC-USP.
- \_\_\_\_\_. (1986c) Arteônica. *Waldemar Cordeiro: uma aventura da razão*. 166-169. Sao Paulo: MAC-USP.
- Flusser, Vilém. (2002). *Writings*. Minnesota: Electronic mediations.
- Fraga, Tania. (2012). Caracolomobile: affect in computer systems. *AI & Society Journal: A Faustian exchange*. 21, 1-15, doi:10.1007/s00146-012-0392-4. London: Springer-verlag. Retrieved from <http://www.springerlink.com/content/d8u21638134u834g/export-citation/> Accessed November 15<sup>th</sup> 2016.
- \_\_\_\_\_. (2012a). Retrieved from: <https://youtu.be/nVjmgROEp5A> Accessed November 15<sup>th</sup> 2016.
- Picard, Rosalind. (2000). *Affective computing*. Cambridge: MIT.

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Tania Fraga is a Brazilian architect and artist with a PhD. in Communication and Semiotics at the Catholic University of Sao Paulo. She is vice-president of the

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Maria Luiza P. G. Fragoso, multimedia artist with PHD In Arts and Multimedia by the University of Campinas (UNICAMP) In São Paulo (2003) and develops research on artistic experimentation in telematic environments focused on trans disciplinary aspects between art, science, technology and traditional cultures. Currently professor at the Visual Communication Design Department at the Federal University of Rio de Janeiro, thesis supervisor since 2005. Elected member of the National Association of Researcher in Fine Arts's directory for the period 2010-2012. Coordinator of the research group REDE-Art and Technology, trans cultural nets in multimedia and telematics, and coordinator of NANO Lab – Nucleus of Art and New Organisms.