

Archiving Digital Heritage: Pioneers of *Fin-De-Siecle* Latina America

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Introduction

This panel tries to open a discussion on the history of the hybridization of art and technology in the last five or six decades, with reference to any specific country, in the Latina American region. It consists of 33 countries of all sizes, from the extensive Brazil to the small islands of the Caribbean.

The idea and main purpose of the panel is to address the under-representation of this new form of art in the global discourse of the art – something that arises out of neglect and assumptions about the world order. Panelists focus their attention on the sunrise of an experimental art that began to embrace more and more of the new technology since the 50s; at times we witness the incipient promises of the art technology hybrid as early as in the 40s just as much as the phenomenon energy oriented art were visible in labs established in other regions of the developed world.

From Argentina, Ricardo Dal Farra, who is a composer as well as an established faculty in electronics arts, speaks of his experience of rediscovering, in a junkyard of the past, some of the most innovative electroacoustic music composers and creators of new forms and the new aesthetics of sounds and music. Some of those figures were little or totally unknown, not only in the annals of music in developed countries, but sometimes also in their own countries. Dal Farra who has been closely working with the Langlois Foundation in Montreal has put together perhaps the most important archive on electroacoustic music of Latin American. Our other panelist from Argentina Andrea Sosa complements this history with a discussion of the visual art of light effects from the same period, namely in the works of Julio Le Parc, active from the same era as when the *Torcuato Di Tella Institute* began functioning as the most important supporter of these emerging trends in art world.

The beginnings of art and technology in Brazil, the largest country in size and population of the region, are represented in the presentation of Andres Burbano who analyzes its artistic scenario. He finds the seed for electronic art and digital photography in the works of Geraldo de Barros who used punched card to modulate abstract photography and whose photography now remains as Burbano shows a pioneering landmark in computational art. Representing the same geographical context, our other panelist Rejane Spitz brings into the discussion the work of three pioneers in

Kinetic and electronic art, namely, Waldemar Cordeiro the precursor of electronic art in Brazil, Abraham Palatnik a precursor of kinetic art, and Otávio Donasci known for his theatrical video performances in the psychological dimensions of social relations. No doubt on about Spitz argument that *electronic art in Brazil has found a fertile ground to grow and flourish*.

Another important perspective in the evolution of kinetic, electronic or digital arts, as well as in evolution of a critical turn in art in Latin America, is valorized by Gabriela Aceves Sepúlveda's presentation. Her objective is to highlight on women artists from Mexico. Like the American poet Margaret Randall, Aceves anticipates the importance of *Telematic Art* of the seventies, *Lorraine* Pinto (born in New York and working in Mexico since 1959) working with sound and light during the 60s, and Pola Weiss a pioneer of video art.

From Peru we have Jose-Carlos Mariátegui who studies the contribution of the Swiss born pioneer electronic artist Francesco Mariotti who is an established artist now in both, Switzerland and Peru. In his analysis, Mariátegui focuses attention on two works: the *Project Geldmacher-Mariotti* presented at the *Documenta* in 1968 and the *Circular Movement of Light* shown at the *X Sao Paulo Biennial* in 1994 representing Switzerland together with other three artists.

Speaking of recent developments in the new media arts, Jose Manuel Ruiz-Martin analyzes the evolution not of the work of any specific artist from Ecuador, but of the laboratories of digital experimentation, the first one of them being inaugurated in 2012. With that context in mind, it is meaningful to start documenting the history of those media labs that will most likely reap the harvest of the new art for the generations to come. Thus the panel stands unique in its diverse range of interest and analysis of art and technology through the entire span of our geographical region and of our cultural identity in the new world.

Author Biography

Reynaldo Thompson is a Mexican scholar working at the University of Guanajuato, Mexico. At present, he is planning to launch a database on the evolution of Digital Art in Latin America (DALA) together with a team of international experts.

Feminizing the archives of digital art: Recovering the work of female artists working in Mexico, 1960-1980

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Abstract

Given the recent interest in developing archives to recover the contributions of Latin American pioneers in digital arts, in this paper I take issue with the lack of attention given to female artists born or working in Latin America. I argue that the process of recovery needed to build such archives needs to adopt a feminist lens that speaks to particular conditions of production and unpacks the local and international mechanisms of exclusion that have hindered the recognition of female artists. It should also consider debates on Latin American art and the recent contributions of media historians who have opened up art history to understand the shared histories of art, science, and technology. Finally, I give a brief overview of the work of three female artists working in Mexico who anticipated features of digital art by experimenting with publishing networks, broadcasting technology and kinetic art.

Keywords

Latin American art, digital art, Mexico, female artists, publishing networks, kinetic art, video art, mail art, archives.

Feminizing the archives of digital Art

The lack of visibility of women in the histories of art, science, and technology extends geographical regions and time periods. This invisibility is the product of deep-rooted patriarchal structures that have historically defined intellectual and scientific fields of action as predominantly masculine spaces (Plant, 1997; Pollock, 1999). Female artists born or working in the region of Latin America have been double excluded from these histories due to their gender and the ambivalent position that the region occupies as neither entirely western nor fully modern. As Canclini has put it, Latin America is the region of the semis “semi-modern, semi-developed, semi-indigenous, semi-European” (Mosquera 1996, p. 231). This ambivalent context has not only complicated the definition of Latin American art but has, until recently, consigned the early histories of digital arts as out of reach for a semi-developed technological region. How should an archive of Latin American digital art pioneers look like considering its uncertain position as neither wholly western nor fully developed? What does it mean to be a “pioneer” from this complex condition of imported references and cross-breedings? Should simply mapping Latin American artist’s contributions into the dominant cannon will suffice?

These are all important questions that need to be asked to define the limits of an archival endeavor. Given the limited scope of this paper and the inherent exclusionary characteristics of any archival endeavor one of the objectives is to pose suggestions on how to feminize this effort to undo a historically gendered and geopolitical position of subordination that have defined the cultural production of the region. Richard defines feminization as a process that breaks down the barriers of biological determinism and fixed symbolic roles, becoming thus a practice of continued contestation which is not only relevant to those who define themselves as women but also to a multitude of experiences that contest normative and fixed definitions of sex, race or ethnicity (Richard, 2004). Then, I propose that the process of feminizing an archive of Latin American digital art should entail questioning the relevance of the dominant structures of recognition imposed by the Western European-U.S. art cannon as well as the patriarchal configurations of the Latin American art milieu. It should make a point of recovering the work of artists that define themselves as female, but it does not propose to exclude those who not identify as such. It should aim to map out categories, networks, and experiences that speak to the ways in which people and ideas cross borders and art is produced as an interconnected lived experience and not in a vacuum.

This process of feminization should also build on significant contributions by scholars who, in the last few decades, have debated the usefulness of the category “Latin America” to describe the cultural production of more than twenty-two nations (Mosquera, 1996; Ramírez, 2004, Camnitzer et al., 1999). How useful is then the category “Latin America” to build an archive that proposes to undo the dominant structures of recognition of the art world? For many, the solution resided in putting emphasis on networks of exchange rather than cultural identities and difference. And yet, others returned to a national model to argue for local conditions of production (Debroise, 2007). In *The Age of Discrepancies* (2007) Debroise and Medina turned their gaze to 1960s Mexico City to recover the works of artists born or working in the country at the time. The thematic structure of the exhibition, which prioritized local conditions of production, was a significant contribution. However, the minimal attention given to the ways in which technology and scientific discourses influenced art during the period and to female artists vis-à-vis well-known male

counterparts signaled the project's adherence to the national art cannon.

In contrast, feminist and media art historians have made important contributions to dismantling the dominant structures of the art world— whether national or global. Feminist scholars have recuperated the role of female artists across geographies and historical periods (Pollock, 1999; Butler 2007). But the ways in which female artists intervene within the broader fields of art, science, and technology remains relatively unexamined. For their part, media art historians have successfully shown how digital art did not develop in an art historical vacuum (Grau, 2010; Paul, 2015; Shanken, 2014). Several have pointed out the connections between algorithmic procedures and avant-garde and postwar art (Paul, 2015, p. 11; Weibel, 2010, p. 21). However, these narratives rarely account for artists working outside the Western Euro-U.S.-Canada matrix. Hence, a process of feminizing the archives should consider and expand on all the aforementioned contributions. Conversely, it should carefully scrutinize the ways in which dominant patterns of exclusion continue to surface in unexpected ways. As an initial effort of recovery in what follows I briefly describe the ways in which some of the work by Margaret Randall (b. 1936 New York City), Lorraine Pinto (b. 1933 New York) and Pola Weiss (Mexico City, 1947- 1990) anticipate the arts of the digital era through their experiments with audience participation, movement, optical illusions, networks of communication and relations of self and technology.

Female artists working in Mexico, 1960 -1980

The 1960s was a decade of unprecedented transformation in the field of media arts. Artists, scientists and technology enthusiasts experimented with new and old technologies leading to the development of interdisciplinary media practices. Magazines became important sites of artistic creation and exhibition. One such magazine was the bilingual (English and Spanish) magazine *El Corno Emplumado/The Plumed Horn* published in Mexico City from 1962 to 1969 by U.S. poet Margaret Randall, who moved to Mexico in 1961, and her husband, Mexican writer Sergio Mondragón.

El Corno, as its collaborators called it, emerged as a response to the ideological pressures of the Cold War. With a printing of 3000 magazines per quarterly issue and a distribution that extended across the Americas and to several cities in Europe and Australia, *El Corno* emphasized art's potential to bridge barriers between nations and political ideologies. For Randall, *El Corno* "was never just a magazine; it was never just a collection of words and images put together by two people...*El Corno* was a network" (Randall, 1978, p. 412).

To create a network, *El Corno* adopted the spirit of mail art, using postal mail as a means of distribution and exchange. The letter section provided its readers with alternative information on important issues of the time. Ultimately, the letters constituted the basis of the magazine distribution. In publishing visual art along with the poetry, prose,

and critical essays of both established and emergent artists, *El Corno* showcased artworks that would otherwise not have been seen together at the time (Aceves, 2017). By facilitating these encounters and conversations through their open editorial approach and their post mail distribution system, *El Corno* was in a parallel dialogue with Fluxus artists, whose aim was to create networks of artists outside the art establishment by making creative use of technologies of communication. *El Corno* spoke to the ways in which Fluxus endeavors challenged traditional notions of the artwork and used existing means of communication to distribute art and create networks (Aceves, 2017). *El Corno*'s use of mail art as a form of communication and distribution anticipates Ascott's notion of Telematic Art and other works that began to experiment with slow-scan TV, fax and radio in the 1970s. Experiments with these broadcasting technologies, as Paul has noted, "represent early explorations of the connectivity that is an inherent characteristic of networked digital art" (Paul, 2015, p. 21).

In the context of the celebration of the XIX Olympic Games in 1968, a year before *El Corno* come to an abrupt end, the international movement of kinetic and op art took root in Mexico City. The games adopted the aesthetics of op art to develop an image of Mexico that would position the country as a modern and developed nation. Due to the political turmoil experienced in the country, which resulted in the massacre of students on October 2nd a couple of days before the inauguration of the games, art critics in Mexico have tended to disregard the categories of Kinetic and Op art because of their connection with the government and the games. For example, in the *Age of Discrepancy* the category "Systems Beyond (the so-called Mexican Geometrism)" is used to describe the experiments of Siqueiros, Felguerez, Cueto, Goertiz, Sakai, Hersúa, and Sebastian with optical illusions, illusory or mechanical movement and audience participation rather than Kinetic or Op art.

In contrast, for Lorraine Pinto, an artist working in Mexico City since 1959 and not included in the *Age of Discrepancy*, the category of Kinetic art has always defined her practice. In 1964 she established the experimental lab of kinetic art along with the electrical engineer Leonardo Viskin and the physicist Roberto Domínguez to integrate light movement and sound to her sculptural practice. The establishment of this lab represents one of the first deliberate efforts to work collaboratively across disciplines integrating science, technology, and art in the country. In 1968 she participated in the *Solar Exhibition* organized as part of the XIX Olympic Games cultural program with the work *Quinta Dimension*, a futuristic model of an urban environment. Made up of two modular city prototypes encapsulated in two plexiglass bubbles, *Quinta Dimension* incorporated sound and light. Viewers were invited to walk around and experience it from different perspectives. As Garza notes Pinto's use of light and sound emphasized the temporal nature of art and opposed the ocular regime that dom-

inated the postwar painting canon (Garza, 2011). After winning a prize with *Quinta Dimension*, Pinto continued to paint and create kinetic sculptures and large-scale public works that incorporated movement and sound. However, it was only in 2012 in the context of Garza's revision of kinetic art in Mexico when Pinto's early experiments were recognized more fully in the company of the male artists mentioned above (Garza, et al., 2012). As Pinto recently acknowledged "it took almost 40 years for her kinetic artworks to be recognized and understood" (XGusto, 2016).

Like Pinto, Pola Weiss also stepped out of the boundaries of traditional artistic disciplines and turned to technology as the basis for her art practice. Weiss began to experiment with video in the early 1970s to propose new ways of thinking about televisual images and broadcasting. After collaborating with both private and state television broadcasters in 1978 she declared herself to be a *teleasta*, a producer of experimental televisual images. From then until she took her life in 1990, she produced a series of television programs and videos in which she experimented with live performance, visual poetry, music, and visual effects.

As one of the first artists in the country to experiment with video, Weiss developed a unique approach. She conceived each of her videos as an act of giving birth, and her camera was at times her daughter or an extension of her body. By using the video camera in this manner and adopting television broadcasting as a conceptual model to reach audiences outside of the art world circuits, Weiss sought to break with the media border to interpellate critical and embodied viewers (Aceves, 2015). Her work was also in dialogue with Telematic Art's emphasis on networked communications and anticipated notions of hybrid constructions of self and technology. For instance, her *video-danzas*, which consisted of live events in public spaces in which she combined performance and video, Weiss transformed her video camera into an eye or a limb as she danced with it in her hand, filming her movements. Simultaneously, her camera broadcasted her movements through video signals transmitted to monitors and reflected through mirrors. At the same time, through visual effects and the incorporation of live feedback, she merged her body with that of the spectator. In doing so, she developed an analog virtual screen space in which the object and subject of representation could co-exist and be merged into one through analog visual effects (Aceves, 2015). In this manner, Weiss's experiments with televisual images challenged passive relations between self and technology

Conclusion

The process of feminizing the archives of digital art involves much more than mere acts of recovery. Critical questions about which artists make into the archive and what categories should the archive consider cannot be taken lightly. As an initial step, I've discussed how the work of three self-identified female artists working in Latin

America was in meaningful dialogue with local and international experiments, and hence, offer different pathways into the histories of art, science, and technology.

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Was part of the media arts history swept under the carpet? (Latin America's lost ark)

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Abstract

Who tells history? We can find multiple versions of electronic art history, most of them with subtle differences, but it has been unusual -until recently- to find references pointing to countries out of a small group from Europe and North America. Several projects have been developed to change that situation. The Latin American Electroacoustic Music Collection, hosted by The Daniel Langlois Foundation for Art, Science and Technology, represents an example of the relevant role that the archiving of electronic artworks and public access to them could have in forming another perspective about (electronic arts) history.

Keywords

Latin America, archiving, electronic art preservation, electroacoustic music history, cultural decentralization

Introduction

The journey from cultural memory and ethical concerns to practical strategies on preservation and the impact of disseminating knowledge generated by electronic art has been navigating a sinuous road.

Memory's death could benefit some as much as the desire for immortality could block the way to innovation open naturally to new generations. Electronic art's memory has been partially dead, or perhaps deaf or blind or simply looking to the other side, maybe to avoid the perception that the so-called digital revolution has reached most of the known world and that history does not happen only in a few "central" countries. The desire of immortality and for being a cultural lighthouse as much as the guardian of the right values and the significant art should not take us all to mislead that intelligence and sensibility belongs to a few.

Who tells history? Who knows about it or who has the opportunity to do it? We can find multiple versions of electronic art history, most of them with subtle differences, but it has been unusual -until recently- to find references pointing to countries out of a small group from Europe and North America. Inequalities have always existed and if we want to see a change, probably we will need to work hard ourselves to produce new results. There are many lost and hidden stories about electronic art that probably should be part of the official history and not just left aside. There have been people, ideas and concepts, artworks, discover-

ies and inventions, and we expect someone to take care of preserving the memory of all that for us but sometimes it simply doesn't happen that way and when we look around after a while, it seems that the history has not been the one we thought it was and we remember, but a different one that is being told by others.

Between the obsession of archiving everything and the difficulty and strong responsibility of deciding what to preserve, the opportunity to archive electronic art makes us face a challenge involving technical issues and political, social, cultural and economical aspects.

How many histories can be told about the same subject? To who is their narrative directed? Today, the digital divide could be not linked to who has access to the web but to who dominates the inclusion of content or develops strategies to keep our attention on certain places and not others. It looks like we are bombarded with cues guiding us to consider that the art conceived by some cultures are the only ones to be recognized as valid.

The Daniel Langlois Foundation for Art, Science and Technology in Montreal has been a leading organization heavily focused on studying theoretical aspects related to preserving electronic art and actually archiving it. A number of major projects have been developed or hosted there since the late 90s, including the Steina and Woody Vasulka Fonds, the 9 Evenings: Theatre and Engineering Fonds, the Collection of Documents Published by E.A.T. and the Latin American Electroacoustic Music Collection, among many others.

Music & technology innovation in Latin America

Political and economic instability in most Latin American countries has been deeply affecting the life of its inhabitants for decades. Support for artistic activities has usually been postponed to solve urgent social problems. In spite of that, the development of electronic arts in general and electroacoustic music in particular in the region is really astounding. To name but a few examples: Mauricio Kagel composed eight electroacoustic studies in Argentina between 1950 and 1953, according to the Hugh Davies' International Electronic Music Catalog published in 1968. Kagel was one of the pioneer composers laying the foundations of a rich history of experimentation and creation in the region. Reginaldo Carvalho and Jorge Antunes in Brazil, Juan Amenabar in Chile, Joaquín Orellana in Guatema-

la and Horacio Vaggione in Argentina are only some of the many names in the ocean of electroacoustic music creativity that has always been Latin America.

José Vicente Asuar composed between 1958 and 1959 in Chile his piece *Variaciones Espectrales* using only electronic sound sources. The Estudio de Fonología Musical was created in the University of Buenos Aires of Argentina by Francisco Kröpfl and Fausto Maranca at the end of 1958. During those same years, and also in Argentina, César Franchisena was experimenting with electronic sound sources at the National University of Córdoba radio station. A landmark in the electronic music history of Latin America was the lab created in Buenos Aires during 1963 at the Centro Latinoamericano de Altos Estudios Musicales - CLAEM of the Instituto Torcuato Di Tella (the Electronic Music Laboratory was part of the Latin American Higher Studies Musical Center of the Torcuato Di Tella Institute). Peruvian composer César Bolaños created *Intensidad y Altura*, the first piece for tape produced at that lab, in 1964. In Cuba, Juan Blanco composed *Música para Danza* for tape in 1961 and *Texturas* for orchestra and tape between 1963 and 1964. Blanco composed about a hundred works using electroacoustic media, including music for mass public events and large venues. Carlos Jiménez Mabarak composed in Mexico *El Paraíso de los Ahogados*, a piece on tape, in 1960. The same year engineer Raúl Pavón built the prototype of a small electronic musical instrument featuring an oscillator with multiple waveform outputs, a white noise generator, a variety of filters, an envelope generator and a keyboard. Named Omnifón by Pavón, his creation was among the first voltage-controlled electronic sound synthesizers. Well before that, in the early 40s, the aforementioned composer Juan Blanco designed an innovative electronic instrument similar in concept to the Mellotron. His Multiorgan was based on 12 loops using magnetophonic wires. It predated the Mellotron -considered the predecessor of the digital sampler, the instrument that changed the way of doing music - by several years. Fernando von Reichenbach invented in Argentina the Analog Graphic Converter in the 60s. It was used to transform graphic scores -from pencil drawings done on a paper roll- into electronic control signals adapted to work with analog sound equipment. José Vicente Asuar produced in Chile a hybrid analog-digital computer system in the mid 70s, exclusively devoted to create music.

Latin American Electroacoustic Music Collection

Unavailability of musical recordings, bibliography and almost any basic reference to the electroacoustic music activities that were developed since the early 1950s in several Latin American countries was commonplace when I started to work in the field around the mid-1970s. That situation did not change much during several decades. In various Latin American countries, universities and state organizations or major private foundations have taken initiatives to support art research and the use of electronic media since the early 60s, but most have stopped before developing enough resources to document their processes

and preserve the results. As a consequence, many early tape compositions have been lost or the master recordings damaged.



Figure 1. The Latin American Electroacoustic Music Collection. Ricardo Dal Farra © La Fondation Daniel Langlois.

The Latin American Electroacoustic Music Collection with over 1,700 digital recordings of compositions by almost 400 composers, accompanied by photographs, interviews, scores, a trilingual historical essay and over 200,000 words in its database, represents an example of the relevant role that the archive of artworks and its public access can play in having another perspective about (electronic arts) history. Today this resource is being consulted extensively by people from around the world (e.g. researchers, composers, performers, musicologists, historians, artists and the general public) helping to transform the traditional perception of "ownership" that has existed in some countries with respect to electronic art history. While all recordings are available online for listening to researchers who ask for an access code to The Langlois Foundation, 558 works are freely available to the general public. The digital recording of a composition can be found by its title, the name of the composer, the country linked to that composer, the year or decade when the work was composed, etc. In addition, there are two playlists to access and listen to the compositions: one sorted alphabetically by the last name of the composer, the other sorted chronologically, following the year in which the piece was composed. Part of the 200,000+ words available in the database comes from two previous research reports I wrote commissioned by UNESCO between 2002 and 2003: *Historical Aspects of Electroacoustic Music in Latin America: From Pioneering to Present Days* and *La música electroacústica en América Latina*. They are available online through the UNESCO's Digi-Arts knowledge portal. These texts in-

clude references to hundreds of composers who were born or pursued a portion of their professional careers in Latin America.

Final words

The Latin American Electroacoustic Music Collection has recovered and made accessible the creative work of many electronic artists otherwise almost forgotten. It has defied the hegemonic narrative of electronic art history, breaking some memory's death roads and slowly shifting and widening the way the history of electroacoustic music has been understood.

Archiving and disseminating electronic art history findings is crucial to comprehend the present and to build a better future.

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Mariotti's ritual artefacts and the origins of media art. In search of the lost multisensorial characteristics of new media

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Abstract

This paper will give an overview of the seminal works of Francesco Mariotti, an artist of Swiss origin (Bern, 1943) who has lived between Peru and Switzerland since 1952 and can be regarded as one of the pioneers of media art both in Latin America and Europe; more importantly, his work linked both continents in distinctive dialogues relating social processes, natural phenomena and technology. In 1968, during the 4th Documenta in Kassel he produced one of the first interactive installations in media art history: "Project Geldmacher – Mariotti". A year later, in 1969, during the X Sao Paulo Biennial, he presented "The Circular Movement of Light", a multi-sensorial (light, smell, sound) installation. Through extensive research of the archives of both Documenta and Sao Paulo Biennial, this paper focuses on these two seminal works with emphasis on their main characteristics and explores how these projects are an early example of works on participatory and social processes, natural and multisensorial phenomena, arguing that through the use of technology, these should be regarded as significant works of the history of media art in Latin America.

Keywords

Multisensorial, Documenta, Sao Paulo Biennale, mutisensorial, Mariotti, media art.

Introduction

Francesco Mariotti (Bern, 1943) is an artist of Swiss origin who lives between Peru and Switzerland since 1953 and can be regarded, though relatively unknown in some circles, as one of the pioneers of media art and whose work linked Europe and Latin America through distinctive dialogues relating participatory and social processes, natural and multisensorial phenomena and the use of technology.

The work of Mariotti is extensive and most of it is well documented and available online on the artist's web site*. However, we will concentrate mainly on two of his early significant works which are perhaps his most emblematic and historical ones during those early years.

Francesco Mariotti comes from an old Ticino family but spent his youth in Lima. In 1964, he returned to Europe,

attended the École des Beaux-Arts in Paris in 1965 and then from 1966 to 1968 he studied at the University of Fine Arts of Hamburg (HFBK). During this time, along with his friend Klaus Geldmacher, they worked on experimental installations as well as mixed media shows.

Documenta 4: Project Geldmacher - Mariotti

While still at the university, the young Mariotti, along with Geldmacher, were invited to present a proposal for Documenta 4 in 1968. The proposal comprised of a model and cost estimate for the deployment of a large cube-shaped metallic structure from which 9,000 light bulbs of 22.5 kw, 1,000 fluorescent lamps and several loudspeakers were arranged. This installation generated a "photo-acoustic ambience" where the audience could enter and experience it. Documenta's selection committee voted in favor of the project but it was denied being located at the Federicianum among more established artists such as Robert Rauschenberg or Roy Lichtenstein. Therein, Mariotti and Geldmacher's project work was to be installed at the Orangerie, where most of the sculptures were located, next to another remarkable project presented at Documenta 4 by Christo: a white large packed air structure (an "inflatable sausage"). Both Christo's and Geldmacher – Mariotti's projects were ready weeks after the opening of Documenta 4. In those weeks, Christo and Mariotti developed an enduring friendship which influenced the young Mariotti to understand the importance of art, not for its aesthetic or technical value, but as a host for discussing and thinking about society.

The Project Geldmacher - Mariotti was based on a manifesto in which they stated, among other things that in an art exhibition as Documenta 4, financed to a considerable extent with government grants, art appears equitable when it is reinforced as an information carrier not only for a minority but for the larger audience. In this way, art's function must illustrate facts and arguments in favor of social change. The main objective of their project was to question the usual superficial beautification of art and to use art products as a communication medium towards a critical analysis of its use in society.

The Project Geldmacher – Mariotti's light and sound effects became one of the landmarks of Documenta 4. It attracted many curious people who participated in the immersive sensorial concert. Inside the cube, a large fan was placed to produce a profound and radical sensation. As it was mentioned in their manifesto, Geldmacher and Mariotti

* <http://www.mariotti.ch/> (accessed 17/03/2017).

ti hoped that these structures, based on thousands of electric light bulbs was going to be able to generate a flow of relevant discussions. From the documentations of that time, there were several cultural activities organized around the installation, so it was used not only as a piece of aesthetic pleasure, but also as stage for discussions on topics such as sexuality, war, philosophy or politics as well as a space for spontaneous live performance and electro acoustic music. Even during daytime, the zinc plated installation covered by large plates of Makrolon plastic plates, was seen as a beautiful architectonic piece drawing a lot of attention from the visiting audience to Documenta.

The Documenta 4 experience was somewhat shocking for Mariotti: he felt that most artists, curators and writers that took part of Documenta were part of a system which evolved into a superficial spectacle of society, instead of using art to bring social, political and ecological change. However, in Documenta he met Rinaldo Bianda who at that time had a gallery in Lugano, named Flaviana mostly dedicated to printed and experimental media. Mariotti started to work with Bianda on artefacts in which the flow of electricity transformed sound into electrical impulses. It was an uncanny system of cables. They both were interested in producing artefacts that through their aesthetic and technical properties could also stimulate more thoughtful discussions, ideas and knowledge sharing. Later, Bianda, would become the founder of the well-known Video Art Festival of Locarno.

X Sao Paulo Biennale: The Circular Movement of Light

After the successful and impressive installation made for Documenta 4 and while collaborating with Bianda, Mariotti, at that time only 26 years old, was invited by the Swiss Federal Art Commission to represent Switzerland at the X Sao Paulo Biennale, along with three other Swiss artists (Camille Graeser, Willy Weber and Herbert Distel).

At the time, Mariotti was just starting to get involved with Eastern religions; in particular, the study of the Indian philosophical religious text, the “Bhagavad-Gita” (which could be loosely translated as the “Song of the Lord”) in which the Lord Krishna answers fundamental questions about life posed to him by Arjuna at the helm of going to war in the Mahabharata. Experiments in the field of aesthetics interested Mariotti, only to the extent that they were conducive to a more profound meditation which could gather a group of like-minded people. A new project for a kinetic sculpture increasingly took the form of a sort of Hindu temple for the “circular movement of light”.

Mariotti chose a penta-dodecahedron with sharpened pentagonal faces for the sphere-shaped temple. The twelve pentagons were in turn composed of five triangles, which in turn were each made up of four triangles and resulted in a structure with a total of 240 triangular faces. The interior of the structure was determined by a central multi-beam light cone with a flame tip. Four electronic systems made the penetrable structure, reminiscent of a crystal-kinetic object.

Beyond the infrastructural and technical complexity of the work, its aim was to comprise a deep multisensorial experience for the visitors. The idea of the work was that within one-hour one could experience a 24-hour day cycle through continuous changes of light, color, scents, temperature, and sound frequencies. It was meant to be not an individual experience but a participatory one, which also generated a very different perception from the individualistic western practice of art we are used to.

For Mariotti, existing knowledge tools were extremely limited to perceive and understand the rich and deep complexity of the world. Western cultural forms of perception of senses were quite limited and many of the canons we had established for each sense act as opposed to the others (Ong 1991, Howes, D. et al. 2014). Thus, Mariotti thought that only by observation and straining all his or her senses will the visitor be able to perceive the continuous change of all these optical, acoustic, olfactory, and thermal effects. Mariotti deemed necessary a relaxed-tensed stay of at least thirty minutes for the audience in his installation, to truly experience the “floating alone in the infinite,” that he seeks with this meditation room. He himself claimed: “Upon each assembly of the temple of light I recognize new messages. The sculpture increasingly strikes me as a spaceship. A spaceship from the astral world.” [...] “I must also say that this astral ship has a therapeutic effect on the visitors. The sound frequencies massage the back-bone from bottom to top up to the brain” (Rotzer 1972).

But what was more surprising at that time, and even for today’s standards, was the installation’s complex setup in which several technical and mechanical components orchestrated an intermingling production of different senses that acted together in unison resulting in a rather holistic experience. The acoustic changes were produced by two tone generators with 36 sound-light channels and two variable sound frequencies oscillators ranging from 10 Hz to 10 kHz can be heard in the interior of the light object over the course of an hour. In some determined frequencies, the sound of water was amplified and at some moment it was heard very loudly. The light program was emitted by the central cone from under the glass floor daily in an hourly cycle with its subtly changing color spectrum, including infrared and ultraviolet rays. During the day, the color program was determined by the natural change in the direction of arrival and the incident angle of the Sun. The olfactory program and the AC-regulated temperature, were modified by the sound state and ranged from ozone to pine, eucalyptus, mint, violets, lavender, caramel syrup and incense –it was based on the sound frequencies to generate thresholds from cold odors to hotter ones–. The idea was to simulate a very special and radical atmosphere.

As it was the case in Documenta 4, Mariotti’s installation for the X Sao Paulo Biennale was also highly commented and appraised by the media. The press at that time mentioned the striking size and complexity of the work: “a structure of 7 meters high and 5 meters width, which symbolized a temple dedicated to oration”. Even for Brazilian standards, the press was quite surprised about the size and

logistics required to bring up such complex work which comprised of 29 boxes (Lux Journal 1969a). Additionally, in contrast to “Project Geldmacher – Mariotti” which was situated quite far from Documenta’s main building (the Federicianum), the “Circular Movement of Light” was located inside the Biennale building, just right of the main entrance, making it not only noticeable by every single visitor but also becoming one of the most iconic pieces, and thus gathering a significant amount of press.

Coincidentally, a special focus on art and technology was prompted by three exhibitions to be organized during the Biennale. One was by the Smithsonian Institution and MIT’s Center for Advanced Visual Studies (led by Gyorgy Kepes) on the existing relations between art and technology that was celebrated significantly in the news (UPI 1969). The second one, organized by French critic Pierre Restany, titled “Art & Technologie” included works of Raysse, Le Parc, Kowalksi, Kosice and Quentin. Lastly, England was due to participate with an exhibition titled “Cybernetic Serendipity”. However, none of those exhibitions, along with many others, ever happened as an international boycott gained momentum against the exhibition due to the evidence of cultural repression in Brazil, governed at that time by a military junta, though some of those countries did participate with other representatives (Lux Journal 1969b).

Such a significant turmoil and the lack of shows related to art and technology also contributed to increase in an interest towards the work of Mariotti, mentioned in some news as the “Swiss attraction” which emphasized its “translucent plastic with lights in movement and mutation”. Mariotti’s “sculpture and Hindu temple” was also mentioned to be “opposed to the creation of serialized art” by proposing a “Krishna Temple, a place for religious contemplation, dedicated to the Hindu god”, he added “after the opening I want to organize a sort of spiritual symposium inside the temple, with all artists” (Almeida 1969).

It is understood that a work such as “The circular movement of light” cannot be measured or classified within aesthetic or formal standards as it wanted to address the visitor in an entirely different way than a work of art usually was able to do. Mariotti’s piece wanted to be nothing less than a kind of total work of art with an emphasized sacred character, an instrument, an impetus for meditation and introspection.

After it was exhibited during the Sao Paulo Biennale for six months, it was partially rebuilt again in June 1970 for the Art 70 Fair in Basel and then in November 1971 it went to Lima, where it was made into a gift by the Swiss government to the Peruvian State as part of the Pacific Ocean International Trade Fair, considered one of the most popular events visited in Lima at that time. Families from different ethnical backgrounds who migrated to Lima may have perceived a completely different experience from the most artistic western-centric one at Sao Paulo or Basel. Interestingly for local passersby in Lima, the luminescent Hindu temple might have been a closer reminiscent of a

mystic space within the Andean cosmovisions, traditions and myths.

The art system is still mostly controlled by the visual sense. Mariotti’s seminal works questioned the status quo of art as a purely visual form by introducing a more holistic form of beauty, one that is maintained through the collective practice of rituals in which the audience congregates in a profound and spiritual multisensorial experience that integrates, invigorates and restores the balance and order in our soul.

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Laboratories and digital experimentation centers in Ecuador: First new technologies art experiences

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Abstract

The Ecuadorian art circuit is feeding on a plastic artists generation based on pictorial practices inherited by modernity for years. They achieved great national and international recognition and even nowadays they occupy privileged places in the most important Ecuadorian art fairs. However, a new generation of artists is abandoning traditional art practices to approach different ways of art making. This change comes hand by hand with the arrival of digital technologies to Ecuador in recent years. On one hand, younger artists have a growing interest in using new media for their creative processes and, on the other hand, different private and public institutions are betting on creating centers and labs for creative experimentation. They are using digital technologies like fab labs, media labs and university laboratories. Considering this, we will analyze the organizational models, the media, the concerns and the needs of the institutions mentioned above. Also, we will address, copyright management and its relation to the social sphere. All of them are relevant data related to the core of current participatory practices. This talk, will allow us to generate a cartography of the new paradigm in the Ecuadorian artistic creation, and, its connection with other international realities.

Keywords

Art & new technologies; Experimentation centers; Ecuador; Creation Labs; New art practices.

Introduction

Art practices related to new technologies are in a pre-birth stage in Ecuador. But, we perceive few symptoms of life, statistically, we can forecast a successful bloom for these art practices. In Ecuador people are starting to gain access to new technologies and understanding in a broader spectrum the possibilities that these offer to art, we can see also an increasing number of contemporary cultural centers and exhibition spaces, where people can connect to new technologies art experiences.

In Ecuador artistic practice in the visual arts field has not overcome twentieth century foundations yet. Most of the artists follow principles of the beginning of the mentioned century, and some of them are attached to conceptual art. Artworks related with twentieth century bases are still popular between pieces presented in art fairs and gallery

spaces. These aesthetics also prevail in the courses offered by University and academic art schools.

Nonetheless, new technology centers and laboratories are slowly appearing in academic institutions. Being the most notorious, University of Cuenca Media lab, UIO Media lab, FAUCE's extended graphics lab and UArtes lab. An analysis of these centers and their artistic outcome, will provide us with information about the position new technology art practices are having in Ecuador. We will be able to see the first relations that art and new technologies are having in this country.

Art Labs: brief historical summary

Medialab centers model has its beginnings with paradigm change related to artistic creation, this changed was directly influenced by the birth of digital and electronic technologies in the second half of the twentieth century. Although "Bauhaus" was a pioneer in this area, new technologies labs were more prolific in the USA. During the sixties and seventies there were prominent faces in new technology artistic research. Billy Klüver and his teamwork directed experimentations under the parameters of E.A.T. (Experiments in Art & Technology) projects, they had a big influence in New York, György Kepes (M.I.T.) and his C.A.V.S. (Center for Advanced Visual Studies) based in Boston and Sonia L. Sheridan and her research project The Generative Systems in Chicago. They were pioneers in making visible the relation between new technology and art. All of them faced traditional conceptions about art discovering a new perspective on the possibilities of artistic creation.

In these collaborative projects, artists were the protagonists and representatives of their teamwork. However, these teams were composed by engineers and technicians, who contributed with their work and knowledge to achieve the goals that artists envisioned. With the artist as a leading figure, interdisciplinary organization had the mission of artistic experimentation. Therefore, we understand the model of media lab, as places that possess technological resources to develop investigations, experiments and artistic works (Ruiz, 2014).

During the eighties and nineties several art centers were established, following the organizational model of the former media labs. Some of them are V2 – Institute for the Unstable Media (Rotterdam, Netherlands), ZKM – ZKM - Zentrum für Kunst und Medientechnologie Karlsruhe (Karlsruhe, Germany), NTT InterCommunication Center and Canon Art Lab (Tokyo, Japan), Centro Multimedia CENART (Mexico), ARS Electronica Center (Linz, Austria).

Slowly, the former organizational model lost its prevalence and dominance. Suddenly it was not necessary to have full equipped laboratories with expensive machines. The arrival of digital and compact technologies and the revolution of social networking democratized the access to technology, giving birth to a new concept of artistic laboratory. The current medialab is a new basilica to the organization of discourses, a meeting place for the voyager, and, a scenario of all the collective experiences that require individual pliability to the foundation of new rules of the game (Alcalá, 1993). Rules that resonate according to the new digital culture, especially social networking websites.

This new artwork, needs to be understood, not only as a production of exhibition objects but also, as a bind to new ways to experiment reality. Artwork that desires to sustain communicative territories between man, machine and society, hence, artwork that creates new interfaces as a vehicle of connection to supply data exchange. (Alsina, 2007, p. 29)

Considering this historical background, a new concept of the media lab has been established. The laboratory is now a metaphor image of a world that is not a familiar and a consolidated system anymore. This is a new metaphor of a system where the relationships between us and the system itself are constantly modified, inherently changing our knowledge and appraisal of its phenomena (Alcalá & Maisons, 2004, p.8). This new system adopts and implements the main features of Internet communicative practices: transdisciplinarity, read & write culture, free & open sources and copyleft. These medialabs have become dialogue spaces, they are creative ecosystems dedicated to aesthetics reflection and debate. They are also places to investigate and produce artwork, and work as well, as places for art education and socialization. These mentioned activities encourage changing processes that belong to an emerging culture, processes that work parallel to the democratization of communications, a phenomenon that has never happened in human history (Ruiz & Alcalá, 2016).

Medialabs and its linkage to electronic arts in Ecuador

During the last few years in Ecuador radical changes on the use of new media for artistic creation are happening. These changes are worth to study.

The first Ecuadorian medialab was inaugurated in 2012, it was the Ecuadorian institution Universidad de Cuenca's medialab. This place is located at the art school building. The University endeavors to create a medialab introduce artists, students, teachers and designers to actively participate in the use of new media. In this center research projects oriented to the analysis of digital art and sensitive design are developed. Most of them are funded by the research department of Universidad de Cuenca. I am going to highlight some of them to recall some of the most successful projects. *Cuenca Sound Map (2016)*, *The most remote place in the world (2015)* and *Dialogue Interfaces(2013)*. At the same time the University has conducted an increasing number of courses open to the community, this introduction of new media to the public has shown the benefits of using new technologies in art practices. The University of Cuenca's medialab has acquired electronic kits and sensors, technologies that border on open source software and freeware. Their technological resources go hand in hand with the standards and processes that most of the international Medialabs apply in their own practice.

Another laboratory is Medialab UIO (Quito), which recently opened in 2016. This lab is in Quito, the Ecuador capital city, as part of the facilities of CIESPAL (International Center for Higher Education in Communication for Latin America). Socially oriented, Medialab UIO was founded as an innovative technological space for creation and experimentation, where trial and error method is fundamental in the artistic learning and development process. This place offers workshops, conferences, expert talks and meetings. This lab has implemented a visual exhibition circuit, where the thematic core is sustained by the following axes: urbanism and citizenship, technology and human body, ludic and inclusive education, innovative entrepreneurship businesses, digital arts, techno-politics and social movements, ancestral technologies and memory retrieval researching. The Medialab website <http://www.medialabuio.org>, positions this laboratory as a confluence for innovative initiatives, which promote in a social way, symbolic and political technological processes. These processes are based on free culture and inclusive education for academic and popular knowledge. Medialab UIO works under the parameters of collaborative and community oriented creative processes. Without doubts, this center is one of the best models of adaptation to the international concept of Medialab. Here, the artwork relevance is relative to the trans-disciplinary dynamics of the teamwork.

Another medialab created in 2016, the FAUCE's Extended Graphics Laboratory. This center is located in the Facultad de Artes de la Universidad Central del Ecuador, (School of Art of the Central University of Ecuador, Quito). This laboratory is born as a research project directed by José Manuel Ruiz (Current director of FAUCE's graduate programs), this project is also supported by the Research Department of the Central University of Ecuador.

The main goals of this place, is to explore creative processes, under the possibilities that expanded graphics that use new technologies can offer. This place also has the function of educating FAUCE's students in the use of new technologies as media for artistic production, and, it also organizes exhibitions and develops publications on the outcome of its several projects. This place is creating academic foundations for a new artistic path that uses new media as a principle, and gradually becoming FAUCE's Medialab. This Medialab project was suspended due to the lack of funds. Nowadays, this project is linking students and teachers to digital media such as: digital printing, image editing software, automatic machine art theories, etc. I see the FAUCE's Extended Graphics Laboratory as a way of reconnecting with the first American art labs.

At last, I'm introducing LAB Uartes, which is actually under an opening process as part of the biggest public art education project in Ecuador, its name is Universidad de las Artes (University of the Arts, Guayaquil). This LAB has arranged several events, meetings and panel discussions to understand and become familiar with new perspectives and models that utterly strengthen the development of LAB Uartes. In between the most prominent conferences we can mention one titled Laboratorios de Innovación Ciudadana, which addressed the issues of encouraging citizens to switch in a more inclusive social model. This follows the ideological line of Universidad de las Artes. One of the participants in this conference was Marcos García, Medialab Prado director (Madrid, España).

Ramiro Noriega president of the management commission and rector of this University, has visited several laboratories and cultural and academic institutions in order to learn from the experience of these places. Between the institutions visited I'm citing: Mind Lab (Copenhagen, Denmark), Aalto University Media Lab (Helsinki, Finland) and Amsterdam Medialab (Amsterdam Netherlands). Maite Freire, LAB UArtes general manager, searched for counseling with José Manuel Ruiz—author of this article. In these conversations we tried to find possible actions to increase the academic community participation in this project. One of the main issues addressed was, the high operating costs of LAB UArtes. As an example, LABoral (Gijón, Spain) faced the same issue, and couldn't keep up through time.

Conclusions

Data indicates that in Ecuador, there is an increasing interest in the use of new technologies for experimentation and creative purposes. Nonetheless, Ecuadorian artists and institutions are not prone to change, and, they are attached to traditional ways of production. Therefore, is important to reach and educate wider publics.

Several laboratories have been implemented in Ecuador these laboratories still work as mixture of the first Ameri-

can labs and current ones. Even if they have a hybrid structure, these centers are oriented to use and consume free and open source resources, they also encourage collective participation processes and questioning of traditional copyrights, aligned to new proposals such as Creative Commons.

Ecuadorian laboratories that are integrated to University Art Schools, are keeping up a strong linkage to artistic practices. LAB UArtes is a peculiar case, its relative short existence does not provide enough outcome for a more profound study.

The centers analyzed in this article are the first laboratories in Ecuador where art, science and technology converge. This is a strong indicator for the expansion of these practices, and also a sign that Ecuador has a promising future in this artistic field.

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PhD of New Cultural and Artistic Practices – University of Castilla-La Mancha, School of Fine Arts (Cuenca, Spain, 2014) with the thesis 'Appearance, impact and effects of the automatic machine at the artist's studio: from the traditional workshop to media lab'.

He has conducted research in the fields of New Media Art, Museology, Read & Write and Digital Culture. His work has focused on the new creative possibilities of Digital Graphic.

As a multimedia artist, his art work has been part of prestigious exhibitions and festivals from Ecuador, Colombia, Venezuela, Belgium, Mexico and Spain, among others countries.

Brazilian Pioneers in Art and Technology: Waldemar Cordeiro, Abraham Palatnik and Otávio Donasci

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Abstract

The pioneering ideas and artworks of three major Brazilian artists – Waldemar Cordeiro, Abraham Palatnik and Otávio Donasci - are discussed in this paper. Waldemar Cordeiro started working with computers in the late 60s and produced some of the most important artworks of the initial phase of computer art. Although his career was interrupted by his premature death in 1973, Cordeiro left an incredibly vast visual *oeuvre*, and a great number of reviews and theoretical articles – including “Arteônica”, a *manifesto* on Electronic Art. Over the last 65 years Palatnik has explored the fusion of art, science and technology in creative, dynamic and kinetic ways. Now in his late 80s, Palatnik is still actively working on the conception of new art forms with different media. Otávio Donasci has artistically explored the combination of human bodies and electronic devices since the 1980s. His pioneering works explored the psychological dimensions of interpersonal relationships, encompassing a great variety of media to create innovative theatrical performances and interactive installations. In conclusion, we argue that these Brazilian pioneers brought extremely important contributions to the field of Electronic Art, and deserve greater international exposure.

Keywords

Electronic Art, pioneers, Brazilian Art, digital media.

Introduction

In a paper we presented at the ISEA 1993 conference - “*Qualitative, dialectical, and experiential domains of Electronic Art*” - we argued that artistic, scientific and technological areas of knowledge should merge into one single process of cognition, since they are complementary parts of the holistic human experience. “Electronic artists are gradually discovering combinations of the expressive potential of human natural languages - which extend over aesthetic, metaphoric, artistic, affective and moral domains - and the objective, quantitative and procedural characteristics of computer technology.” (Spitz, 1993). By that time – over 20 years ago – electronic artists around the world were already fully exploring, criticizing, interfering in and expanding the creative potential of the fusion of art, science and computers. In fact, they were giving continuation

to a movement which had been initiated a few decades earlier by some pioneering artists, whose theories and works - developed during the very embryonic phase of our digital era - inspired us all.

In the Brazilian scenario, pioneering artists such as Waldemar Cordeiro and Abraham Palatnik started to explore - as early as in the 60s - the unlimited number of possible combinations of art, science and computer technologies. In the early 80s, Otávio Donasci started to create new expressive languages by combining human actors with digital media, giving birth to his amazing “*videocreations*”.

Although each one of these professionals has contributed to the artistic field in a different way, their pioneering ideas and artworks – which will be discussed in the next sections of this paper – all pointed to the intersection of art, science and technology, and paved the way for the development of Electronic Art, in Brazil and abroad.

Waldemar Cordeiro: rupture and arteônica

In a time when Brazil was barely entering the age of electronics, Waldemar Cordeiro was already creating art with computer technologies. He worked systematically with “computer-aided art” from 1968-1973, in São Paulo, and is considered to be the precursor in the use of computer in the arts in Brazil (Cordeiro, 2014a).

Cordeiro was born in Rome in 1925, but was registered as a Brazilian citizen. In 1946 he moved from Rome to São Paulo, and settled down. The effervescence of his ideas led him to work in various different fronts – as a journalist, painter, illustrator, artist, landscape designer, urban planner, art critic and theoretician (Anagnost, 2010). “Cordeiro’s *oeuvre* was a work in progress, a constant evolution.” (Cordeiro, 2014b). He studied figurative art, produced Cubist works, Concrete art, ‘intuitive geometric painting’ and ‘Popcrete’ art, and “turned to kinetic and *opera aperta* works, in 1967-1968, which preceded an investigation on computer art that the artist named *Arteônica*, from 1969-1973.” (Cordeiro, 2014b). In “*Arteônica*”, Cordeiro highlighted the need for new paradigms and goals for the creative use of electronic media in the Arts, raising innovative, critical social and aesthetic issues which are still of great significance today (Cordeiro, 1972).

Cordeiro's utopian and revolutionary worldview "introduced a critical vein and participative character into the somewhat aseptic and Cartesian environment of the Concrete and electronic arts, enlarging their reach and lending them a new meaning." (Machado, 2014). By means of their capacity "to translate reality into digital form" and their ability "to offer developmental alternatives through simulation processes", Cordeiro believed computers had the potential for changing society (Fabris, 1997).

Although his career was interrupted by his premature death in 1973, in his short period of practice Waldemar Cordeiro left a vast *oeuvre* (Cordeiro, 2014a), a visionary legacy of writings and artworks, which testifies he was an artist much ahead of his time.

Abraham Palatnik: forms & dynamics

One of the precursors of kinetic art, Abraham Palatnik is well-known for his artistic sculptures in which color pieces move beautifully as parts of a complex system of motors and gears.

Born in the North of Brazil, Palatnik spent his childhood in Israel, but in 1947 - at age 20 - he returned permanently to Brazil. In Rio de Janeiro, Palatnik began visiting the Dom Pedro II Psychiatric Hospital, coordinated by Dr. Nise da Silveira, where he saw works by schizophrenic patients who had exceptional production, without prior art training. Palatnik then "abandoned his brushes and began to establish a freer relationship between form and color, since he realized that his own production was impotent in the light of the work of those artists" (Jornal do Brasil, 2017).

This research led to his first "Kinechromatic Device" - "Blue and purple in first movement" - a motorized light sculpture that created a play of light and shadow in space - which was awarded an Honorable Mention by the international jury of the First International Biennial of São Paulo, in 1951 (MAM, 2014). Worth mentioning that his work was initially refused by the jury, because it did not fit into the traditional categories of painting or sculpture, but ended up in the show only because one of the international delegations could not participate in it (MAM, 2014).

In addition to creating kinetic objects, mobiles and drawings, Palatnik worked on many other fronts, including furniture design, cardboard and wood compositions and painting on glass (Spitz, 2005). Along different decades, he also worked with three new materials in succession: "in the 70s, polyester resin, in the 80s, strings on canvases, in the 90s, a plaster-and-glue compound." (Morais, 1999).

Self-taught, the artist considers intuition to be his "initial impulse." He describes it as the feeling that something artistic can be done with a non-artistic situation: "In my case, this path goes through intuition, then through thought and reasoning along with intense experimentation, and finally through a careful and careful process of construction." (Revista Museu, 2017).

Palatnik - who is now 88 years old - still actively works on the conception and production of new art forms which

involve different media. In his atelier in Rio de Janeiro, you will find him surrounded by nuts, bolts and tools built by him, always researching into new materials, forms, media and ideas.

Otávio Donasci: video creatures & theatrical performances

Otávio Donasci - also a pioneer in the field of Electronic Art in Brazil - is internationally known for his theatrical performances, or "VideoTheatre".

Born in 1952, Donasci started mixing arts and technology in the 70's, by experimenting with forms of video art. He has been exploring the combination of human bodies and electronic devices since the beginning of the 80s.

In 1983 he created his first "*videocriatura*" - a hybrid being, resulting from the creative merging of visual arts, theater, video technology and performance. In his fantastic performances, actors use video monitors (attached to a cable video recorder or wireless transmission) covering their heads (or other parts of their bodies), which are then substituted for the parts of the bodies of off-stage actors, captured live by a video camera or pre-recorded. A *videocreature* is "half human, half machine". The monitor screen may show a pre-recorded video of a face singing songs, or reciting monologues, or talking live with the audience, or in some cases, talking to other "*videocriaturas*".

With his *videocreatures*, Donasci expands the expressive capabilities of actors by incorporating a myriad of resources and possibilities of the audiovisual media to their performances. The resulting effects are intriguing, surprising, and absolutely convincing and effective, in spite of being made with domestic video equipment and handcrafted resources, in most of the cases. "It is not only five the senses called for the exploration of a new field of technological art. [...] Indeed, what is at stake in electronic art is not the use of high technology techniques, but the formulation of new languages. When I explore holography to write the holopoems in space, or when Otávio Donasci uses electronics to dramatically perform his videotheater, we are faced with "poetry" or "theater" that are inscribed in the irreducible possibilities of each interdisciplinary process, or of each "hybridism", as Donasci prefers to call." (Kac, 2004).

Donasci's pioneering works explored the psychological dimensions of interpersonal relationships, encompassing a great variety of media and techniques to create performances and interactive installations. He also created and produced theatrical performances, such as "Viagem ao Centro da Terra" and "Merlin" (in partnership with Ricardo Karman) - a performance which lasted five hours, in which spectators were being physically transported (inside a truck) from São Paulo to another town. In spite of its great repercussion in the international press, the very high cost of the project "Merlin" unfortunately allowed only three performances.

During his more than 30 years of career, Donasci has developed more than 20 types of *videocreations*, and has performed all around the world, winning several awards.

Final considerations

As foreseen by Cordeiro in his “Premises for artistic development in Brazil”, which he wrote in 1969, “Brazil is the world’s greatest experimental laboratory. Large-scale demand and an innovation-friendly mind set are key factors characterizing the general state of art in Brazil.” (Cordeiro, 1969).

In fact, electronic art has found here a fertile ground to grow and flourish: Brazil has today a significant number of artists, publications, academic conferences and exhibitions dedicated to the field of Electronic Art, as well as a great number of internationally awarded artworks.

The great expansion of the field of Electronic Art in Brazil, over these 50 years, has much to thank to pioneers such as Waldemar Cordeiro, Abraham Palatnik and Otávio Donasci, who envisioned the enormous potential of the merging of art, science and digital technologies. We believe that their original ideas and artworks - which inspired us all along all these years – deserve greater international exposure.

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Proto-Computational Arts and Photography

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Abstract

How Geraldo de Barros obtained abstract photographs using disposed punched cards makes evident that the origins of the interaction between algorithmic devices and the arts are deep and there is a clear need to describe the visual artifacts, and the historical and technological contexts as well to better understand his work. José Oiticica Filho and de Barros expanded the use of photography beyond the camera operation focusing on experiments in the darkroom. I have proposed that Geraldo de Barros must be recognized as a pioneer of computational arts “because he developed a method for using punched cards instead of the negative Film in the darkroom, exposing the photographic paper several times while changing the distance of the enlarger lens to the photographic paper in order to magnify or minimize the size of the rectangles through which the light would pass creating complex abstract compositions in the photographic paper”.

Keywords

Proto-computational Arts, Algorithmic Devices, Early Computers, Geraldo de Barros, Jose Oiticica Filho.

Introduction

This research must be contextualized within a larger scope project that is systematizing early interactions between computation and the arts. This project identifies several layers in time, starting with proto-computational initiatives in which the notes written by Ada Lovelace about the Analytical Engine (1839) and its potential capacity to compose music occupy a unique place. Nevertheless, there are several other examples in the modern history of computation where it is possible to trace early encounters between the computers and the arts. For instance, the interactions between computation, the visual arts and cinema in the case of Konrad Zuse in Germany in the decade of the forties (Burbano, 2013), the interactions between literature and electronic writing in the case of Christopher Strachey in the UK in decade of the fifties (Link, 2006), the case of Electronic Music production in the CSIRAC in Australia in early fifties too (Doornbusch, 2005). The experiments made by Geraldo de Barros in Brazil with punched cards storing binary code translated into photographic experiments are a rare case in which a Latin American artist anticipates the deep relation that computation and photography will have several decades after (Burbano, 2013).

Konrad Zuse

The opening phase of my research about early computation and the arts was the examination of the work of engineer Konrad Zuse (1910-1995), the responsible of developing the Z1 and Z3 computers, the Z3 made in 1941 is arguably the first fully programmable computer. In several of his pioneer computer devices, Zuse used punched film stock as a storage medium (to store data and instructions). Fragments of celluloid with frames showing cinematographic scenes punched with digital code remain as a mysterious trace of intersection “between cinematographic image and computational code” (Rojas, 2002). After writing about the meaning and significance of Zuse’s method I had the impression that the relationship between binary code and the cinematographic and/or the photographic image was a unique feature of that isolated example (Burbano, García, 2016). The findings of the work of Geraldo de Barros showed the relationship mentioned above could be explored in depth in other scenarios. More importantly, there is a need to find possibilities to elaborate a discourse capable of articulating these two phenomena.

Barros and the Darkroom Experiments

Between 1949 and 1951 Geraldo Barros produced seven photographic works made with punched cards, these experiments are notorious nowadays and some of them are part of important collections worldwide like the photography collection at MOMA in New York. Today is clear that Barros “played” with the punched cards in the darkroom controlling the light exposition and the sensitive photographic paper. A new material analysis shows that he was using other additional materials in the process like cellophane paper. In the absence of a photographic negative, there are no physical sources from which make copies of these seven works. These pieces have no particular title and are part of the “Fotoformas” series, an influential photo collection of more than fifty works (Girardin, 1999).

Photographic Context

Originally when conducting research about Barros, there was not much information about the context to explain his experiments at the photographic level, in the last two years I have had the opportunity to re-collect information about that aspect. We can start with a glimpse of the history of photography in Brazil. In the transition between the forties and the fifties, there are exquisite examples of experimental photography there; these works have been linked to

the Concrete or Constructivist art movements (Espada, 2014). Amongst the practitioners is José Oiticica Filho, father of influential artist Helio Oiticica. Oiticica Filho who made abstract photographic works like “Forma D-10 A” was part of the artistic scene in Rio de Janeiro while Barros was part of the one in Sao Paulo, both can be seen as key figures of the photographic modernity in Brazil in a period where Biennale de Sao Paulo was founded, and several important transformations in the local art scene took place (Herkenhoff, 1983). Both of them started to work with photography more or less at the same time and contrary to other contemporary creators using the same medium they focused on the dark room and the materiality of the photographic process as key elements of their creative practices. These two artists also have in common their heterodox careers, as far as Oiticica Filho was originally trained as an entomologist and Barros was working for the Banco do Brasil part time, this double action opened several doors to unknown fields for both of them.

Thinking about the historical context to explain the apparition of experimental photographers like Barros and Oiticica Filho I would like to refer to the work of another important Brazilian pioneer in the field of photography. In 1901 Valério Vieira (1862-1941) made the influential photographic composition “The thirty Valerios” a rich photography with significant elaboration in the dark room, an image that can be seen as an anticipation of the manipulation of layers in the computational photography and that can be clearly seen as a premonition of what Photoshop, and other software to process photography based on the layers principle, does to contemporary photography. However, at the conceptual level we can observe that the promise of computer imaging that Vieira examines in his picture is based on the figurative front of photography, while in the case of Barros his investigation occupies the abstract side of it.

Technical and Technological Context

Of course, Barros made his experiments before any computer was actually able to produce computer graphics or digital images. At that time the calculators or tabulating machines were unable to produce any visual output, no computer screen was even implemented therefore computer graphics were not in the plans of the most audacious computer makers at that time. The first commercially available computer, the UNI-Versal Automatic Computer I, was available the same year that Barros was working in his experiments with tabulating machines, an IBM machine at the Banco do Brasil, it is clear now it was not a computer as such, as far as the first computer, a Univac-120, was imported to Brazil in 1957.

The typology of the punched cards used at that time is relatively easier to track. Because of the shape of the rectangles seen on the photographic experiments by Barros is possible to identify that the cards used were the IBM “80-column punched cards” introduced in 1928. Those cards were a global standard for several decades. When Barros made his experiments IBM had bases in several Latin

American countries (Medina, 2008). At the time I came across the work done by Barros, “I found myself confronted to a constellation of phenomena that emerged at that moment in history more or less pointing in the same direction: unusual, unseen, often misunderstood creative phenomena made with binary code punched cards or punched film stock, two examples that can be regarded as instantiations of the same phenomenon: the early interaction of the digital code and the photochemical image” (Burbano, 2013).

Proto-Computational Photography

The originality of the photographic experiments made by Barros and Oiticica Filho are based on their creative use of the photographic equipment in the darkroom. They were building upon the basic idea that not only the photographic negative but, in fact, any transparent object or surface with holes can be used to interfere with the transit of light, the photons, from the enlarger light bulb to the sensitized paper. This can be seen, of course, as the manifestation of a deep understanding of the photographic equipment functionalities. Nevertheless, a characteristic that remains distinctive of the work done by Barros is his use of cards with binary code punched, this process shows an additional sophisticated level of creative relationship with the machines, in this case, the IBM tabulating machines used at Banco do Brasil. His approach shows an imaginative view of the material elements and the technical processes, how a piece of equipment used here could be used there, how a material disposed from one process could be used in another one. This particular method is no doubt one of the patterns of technological innovation nowadays (Johnson, 2010).

The survey about other artists or technicians working in a similar path to Barros has been fruitful in some ways. First of all, the investigations exposed that in the experimental level there is indeed a good close example in the manipulation of photographic material in the dark room. The quality of the work of José Oiticica Filho shows how advanced was the scene in Brazil and reflects well the inspirational changes in the artistic world at that time (Oiticica Filho, 1983). Nevertheless, I was not able to identify other photographers doing experiments with punched cards; this remains a distinctive path of Barros creative endeavors. Finding another experiment in that specific way is hard if no impossible.

However, there is a novel way of exploration that has started. This short text began with the mention of pioneer Zuse’s work, which has an important signification for the computer history but also for the media art history. After doing a general review of Brazilian computer history in order to find possible examples of computational creativity related to the work done by Barros I found a new interesting track that can connect this story in Brazil and the one of Zuse in Germany. Zuse had a partner in the development of the Z1 and Z3 computers (Rojas, 2002), who actually helped him to use telephone relays and who later on suggested to use vacuum tubes to make computations.

Zuse's friend is Helmut Schreyer who was a computer pioneer and partially responsible for the achievements of the construction of first computers made with Zuse. Schreyer after the World War II immigrated to Brazil, to Rio de Janeiro specifically, where developed an academic career joining the *Instituto Militar de Engenharia* (Rojas, 2010) and he also used to work at the *Departamento de Correios e Telégrafos*. Therefore there is a new branch to explore on the intersection between computation and Brazilian art history.

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