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The Interactive Digital Choreography: Innovative Women in the Dance History

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We are interested here in highlight relevant aspects and innovations of some studies that describe the choreographic implications in interactive art based on movement, as well as some experimental and theoretical references proposed by women who had a pioneering role in the History of Dance.

We are interested to describe, analyze and propose to dance a new concept: the concept of Interactive Digital Choreography. So our focus is in the digital choreographic possibilities with interactive quality, and contributions and new ideas proposed by women who participated in the recent history of Interactive Dance. It rather is an attempt to write the history of dance in interface with new technologies, highlighting those contributions often not revealed in official written, and generally male, history of dance.

Let's start some concepts and components that help us understand more deeply the Interactive Digital Choreography. The Interactive Digital Choreography explored in this work shares some features with Interactive Art. We consider that the concept of Interactive Art comes from a continuation of the artistic movement advent of interactive installations that arise with the first facilities of videos installations that team together with *happenings* and conceptual art; all of them are part of the artistic movement of the 60s.

The first woman that we have to stand out for her contributions and research on our topic is the Prof. Gretchen Schiller of Brunel University (England), Schiller proposes

that "the practice of dance and improvisation, contact improvisation, happenings, social dances, games using motion, or martial arts such as capoeira Angola have characteristics that are interrelated with the definitions on art interactive. As the interactive art, these forms of dance require participation; they connect the body through immersive movement and interactive environments, a place that dancers can feel internally processed within the context of improvisation. This context generates new choreography and performances by feedback"¹. Schiller thus builds the argument that interactive art based on the movement is a form of Interactive Art. The difference between interactive art based on the movement and interactive art itself is a subtitle.

Schiller's specialization is important for the proposition that interactive art differentiate of interactive art based on movement because it includes both the practice of physical movement, as well *mediadance*² and choreographic attention to participate in the interacting dynamics of the movement. We are proposing, from Schiller, the Interactive Digital Choreography, is one option or a category of Interactive Art based on the movement.

Each of these experiences, and creations developed by choreographers with their software, offer different notions of what is the conception of motion, the proposal of interactivity, or even ideas of what is an interactive choreographic system.

Schiller believes that the team with interactive art based on the movement has a kinetic predecessor arts dating from the early twentieth century with the Realist Manifesto. We could not fail to mention the kinetic arts when we are proposing a study on the art of movement, on dance. The choreographers, which are accentuated in the complexities of body movement, are developing practices, artifacts, software, and theoretical production that contribute to the repertory of researches related to the art of choreography, with the Interactive Digital Choreography.

We consider, according to Schiller, at an early stage artists expand the concept of body, through the materials and technologies, as a precedent for Interactive Art based on the movement. Sure there are many examples of dance choreography in which technologies were used, not just digital, transcending biological limitations of the body, such as the introduction of pointed shoes in 1832 in the ballet "La Sylphide", but it was with the artifacts created by Loie Fuller in the late nineteenth century, artifacts used to multiply her body in multiple images, or even convert it into animated shapes of flowers, orchids

and streamers, either through a sophisticated game of mirrors, either through a very complex system of lighting and special suits, named as *under-lighting system*, which created and patented, that Fuller added a new and revolutionary conception of dance.

Loie Fuller is regarded by us as a first dance matriarch in interface with new technologies, as well as being innovative in her proposal the dancing body as a body-image, and no more than strengthening the body as a mere player movements, she reconfigures the role of being a woman and artist in the late nineteenth century: she was producing her own performances and also other artists works like Isadora Duncan, she also had activities as theater director, multimedia artist and researcher of the art, taking on roles previously filled just by men.

The contributions of Fuller's where is the beginning point for all of us who work contemporary with dance and technology, not considering it would be a mistake due to ignorance, and we can say that in the history of dance the event that there are not many historical records of her person just shows male and official state of dance writing until the twentieth century, always emphasizing again the life and works of great choreographers and dancers. Fuller's contribution is a big paradigm shift to dance, to propose dance as a visual art and not just an art of movement, but historians do not realize even yet.

Following Schiller, in her thesis she illustrates how the body moves through, pierces the material, thus transforming the body into a composition of many other materials and dynamic means, reconfiguring its own. That is why it is important to also record the relationship of dance and videographic and film production.

Schiller builds an important historical retrospective considering the categories of dance and film proposed by director Allegra Fuller Snyder, to develop a historical review of technologically mediated art works and the different stages of the relationship between dance and technology.

So we have in the 60s Snyder proposing three distinct categories of dance and film. One would be the simple recording of a dance, where with just one camera, and also just a unique point of view, the dance danced on stage was recorded, another is the documentary film category of dance, where the narrative is respected but dance is adapted to film by using the camera close-ups, made distinct, and other technical

capabilities, and more cameras available, and finally the cinedance, or "choreocinema" (a term proposed by John Martin), that is the creation of a new art, which can transcend the biological potential of our gravitational body and where it was introduced, according to Snyder, new possibilities of the body. Last category is the one most closely related to the topic of this work and in the emerging Interactive Digital Choreography alternative ways of moving bodies, new body shapes.

Snyder believes that film and video dance invite and bring the audience closer kinesthetic, that is, to within the transforming experience of dance, as opposed to the earlier act of dance or just go see the movement. Snyder believes that the camera and editing introducing alternative forms of sensation kinesthetic of "space, size, depth, no-gravity, time, movement, and expansion of a new logic, rhythm and reality"³. The cinedance and experimental and popular films, invite the audience to start to see more kinesthetic action recorded, and invite the body audience to move kinesthetically and internally through various movement qualities and locations.

Cinedance is also a possibility to show different and intimate views of the body that were impossible for the "frontal view dance", traditionally seen on Italian stage. For Snyder, though the audience is fixed in their places to attend, cinedance offers the chance to dance internally or kinesthetic "feel and move" to and through space and time, linking dynamic spaces and fictitious states on the screen.

We propose that the possibility of Interactive Digital Choreography is a historical flow, after the experiences of choreographers with the language of cinema and video. It was this previous load testing on the visual arts, film and video, that facilitates the way, since the 90s of the twentieth century, to interactive choreographic art development.

Based on Snyder's previous studies and experiences, Schiller in her thesis proposes three categories which differ from the ways in which body movement is translated or transposed to material forms, through technologically mediated processes. These categories are not totalizing but are presented as tools to aid in understanding the ways in which the movement of the body becomes disrupted, thus offering new possibilities for body and how was it built this closer relationship between the language of dance and technology.

With the Schiller's categories of corporal knowledge, the movement crosses and

transposes itself artistically in other materials. That puts the interactive art based on the movement thematically within a historical context and interdisciplinary, not just as a response to the dance and technology community of 80, resulting from the widespread popularity of computers. We believe that the possibility of the Interactive Digital Choreography is very productive to propose and experiment with "new bodies, bodies built through interactive software.

The categories proposed by Schiller were initially used to describe visual art forms, are they: *Trans-figuring* describes artwork where the figure of human body ranges from being visually recognized or not, *Trans-forming* describes works in which the human figure is close be recognized, yet it is through its abstraction, and kinesthetic sensory being perceived and *Trans-planting* characterized works of art which are based on characteristics of body movement as bodies not recognized or not necessarily perceived as kinesthetic form. These categories basically describe visual art forms, and we need to understand that we are appropriating Schiller's categories to support the Interactive Digital Choreography is also a form of visual arts.

Let us begin to think more specifically about the characteristics of the Interactive Digital Choreography, recapturing some historical and conceptual points. Historically, we have to consider interactivity as an aesthetic category that did not derive from the classical concepts of composition or choreography, and it was always related to the avant-gardes productions of the twentieth century and its performative experiments, such as Dada, Futurism the surreal performances, and there was interactivity as a conceptual tool for the activation and provocation of the public.

To understand the Interactivity of contemporary events we need to understand the events that happened in the history of art in the 60s, with Fluxus, process art, situations, kinetic art, conceptual art, art and technology. We need to understand the collaboration of the work of John Cage, Robert Rauschenberg, cyber art, installation of closed circuit video and others, and of course the progressive "dematerialization of the art object", which involves the active and physical public PARTICIPATION in the event.

Since the 70s, the interactivity in art generally refers to multimedia installations and experiments that involve electronic interfaces or assisted by computers. In the 70s, interfaces are characterized not only by their contact points and interaction between the machine and the physical, or the information of the experiment, but also by the artistic

strategies used to wrap the audience inside the artistic dialogue.

Comparing with interactive installations and digital art works, sound sculptures, immersive experiments, computer games and more recently Internet-based forms of telepresence, the INTERACTIVE DANCE, in a more restricted survey of designated assisted art computers, can not revindicate to itself as long and heterogeneous history.

At one time, the dance creators are widely performed dance work in multimedia scenarios, sophisticated structured for consumption and aesthetic contemplation of the audience. Dance installations and online interactive dance, which activate the participation of the users, are rare events that require special attention and analysis, especially since we do not have established aesthetic or social criteria for an evaluation of this interface.

According to Professor Johannes Birringer⁴ (Brunel University, England) in the area of interactive performance, and we would add interactive dance performance, we consider the term "Interactivity" for us to refer to two phenomena. First, the "Interaction" as a spatial and architectural concept for the performance, and also the word "interactivity" in a census more closely to collaborative performance CONTROL SYSTEMS (cybernetic systems) in which the movements of the performer, gesture and action, are captured by the cameras and sensors and used as input to activate or control properties of other components such as videos, sounds, MIDI, text, graphics, QuickTime movies, scanned images, etc. An "Interactive System" would be a system that allows the performer to generate, synthesize and process images, sounds, voices and text sharing and proposing a real-time event.

To propose "Interaction" as a concept and architectural space for performance, means doing an exercise to remove the focus we have in the dance, as to the creation of steps, phrases and choreographic combinations, or even from the stimulus to create dances from "points" of the body, removing the focus of consciousness inside the body, contemporary stimulated by certain practices such as yoga and other techniques for bringing not just a space, but more broadly exercise dance as an relational architecture where space influenced dance, and dance can create forms, and created forms in space change again the dance, in a feedback process.

To emphasize attention to the contact, weight, and in the transferred energy when a

couple dance, as practiced in contact improvisation, is a good preparation for later work with the physically motivated sensor interfaces, especially sensors that can be coupled to body. This re-orientation in space also means the initial knowledge of how the lights can sculpt the space, or as the color of light, angle, temperature and intensity are constituents of the spatial dynamics and mediate the plasticity of space that creates and opportunities for movement.

For bodies that move and change lights in space, bring more an awareness of how the body resonates in a space that echoes, they are part of the collective consciousness in which we are involved, in which where we are invited to become co-creators and participants of the work. This notion of a resonant space involvement presents itself in the plastic and sculptured processes that dancers, visual artists, media artists, programmers and architects are exploring recently is a process of drawing in the "smooth space" that allows the integration of a "nervous" or "significant" presence of the media.

For Birringer the sculptural process emerging in this contemporary dance and new interface technologies can be analyzed as a change in the line proposed by the concept of space of Rudolf Laban, and in the principles of kinesthetic abstract constructivism of the Bauhaus, in addition to the ideas of social sculpture of Joseph Beuys and Hélio Oiticica. What Birringer suggests is that with this construction and architectural space we have the possibility to envision a non-Western and non-Euclidean way of analyzing space science and geometry. We believe that in this new interactive architecture for the dance we have a new philosophical condition that enables us to be harmoniously within the contextual space that we live, in which we are immersed and which are inseparable of our bodies. In short, a performative relational architecture that invites participation, and that did not exclude virtual architectures, on the contrary, the dance and changes in the notions of a specific place in interactive installations need to be discussed including virtual reality, immersion models comprising fiscal and synthetically, the 3-D simulators, to recognize the connections between design based on spatial representation and designs generated by algorithms.

Recent studies unwrapped in computer science, artificial life programming and 3-D (VRML) suggests hybrid combinations unimagined and studies for the performance of which has a considerable impact on collaborations between choreographers, composers

and designs interested in complex, imaginative and dynamic "improvisation technologies".

In a possible expanded architecture, the performers can do physical and tactile experience lies related to virtual reality, in which they can modify and transform the space, moving through the projective world generated by computers, that means that the performer moves through waves, fields of color and pulse, sailing between virtual objects, so the body can experience potentially a kinetic rupture caused for our visual senses, expanding the surface of our physical body and getting an extension on its sense of touch. It is also dissolved the traditional division between performer and audience, building an interactive performative space together.

In the spatial structure, where the interactivity above changes the perception of many practitioners of dance, used to work in real spaces defined, and a proscenium position within the stage space, or forward to a passive audience sitting in their chairs, for a realization that breaks that sweep between performer and audience, and requested the choreographers new vocabularies, vocabularies consist of interactive designs and VRML (Virtual Reality Modeling Language), notions such as parameters, mapping, navigation, collection systems, tracking , MIDI (Musical Instrument Digital Interface), genetic algorithms, specific languages such as MAX/MSP.

Moreover, the use of these new technologies in dance, for Interactive Digital choreography creation, we need the minimum requirement of basic understanding of computational processes, which are generally invisible. And it creates contemporary concepts derived from "emerging" science or as self-generators systems.

In dance, you can already see very significant events regarding the use of new technologies. One of our works, fig.1 and 2, within the collective i-Arch bodies⁵ (interactive architectures of bodies), using the Isadora software, developed by Mark Coniglio and Dawn Stoppiello (Nova York) and free Processing software, we construct a piece for generating from a dance human body various other bodies, and build an special architecture so that every movement causing delays and these delays get a scale of RGB color on red, green, blue, as you can see in <http://www.youtube.com/watch?v=OOjGYvrrr28> .

Further highlighting the importance of women in Dance History and Technology we consider that in addition to Loie Fuller, Allegra Snyder, in the beginning of 80s (twentieth century) a group of graphical interfaces researchers at the University of Simon Fraser (Canada), led by Thecla Schphorst, a graphic designer who had already danced professionally, developed the software "Lifeforms", software that lets you create the choreography in a virtual platform where you can watch the choreography of several earlier points impossible, as above, to the right, behind, and others. The most significant potential offered by the "Lifeforms" is that you can see the choreography in a more lively and not static, as when delineated on paper by choreographers.

It was a woman who developed the software "Lifeforms" with her team, but it was much more famous the choreographer who developed the first work with the "Lifeforms", the north American choreographer Merce Cunningham.

Would be there a mistake of the male official story of dance that always appoints Cunningham and "Lifeforms" associating, forgetting its creator Thecla Schphorst? We cannot fail to record that for decades and decades the choreographers were mostly men, and therefore women dancers performed their ideas, and of course did not receive payment in the same values. It also happened with the written and official History of Dance, which for decades had only male writers such as Paul Boucier, Roger Garaudy, and Antonio Faro.

Cunningham worked for many years with the "Lifeforms" software in their study of dance in New York. After Cunningham many other choreographers to benefit from the use of the "Lifeforms", I myself come to using the same facilities in video dances, fig.3, and/or dance scenes where the animation made by digital bodies interact with "real" human dancers. A growing number of international choreographers and performers began to experiment with the computer together dance and new digital technologies. This event cannot be seen as a surprise because since the 80s of the twentieth century the dance has been having its supports as film or video.

However, we can reflect on this fact. If Cunningham was as a worldwide reference for the pioneering use of software "Lifeforms" applied to their choreographic creations, we would like to give credit to the great importance to us the figure of the creator of the software "Lifeforms", Thecla Schphorst. Of course, after "Lifeforms" came a whole family of editing softwares and softwares created specifically for interactive

performance, to include the "Isadora" developer by Troika Ranch Dance Theater Group (U.S.A.), the "Eyecon" software developed by Palindrome Inter.media Performance Group (Germany) among others. So we declare Schphorst as well as a matriarch in the fields of dance and new technologies.

We still can not forget the first experiments in this area of dance and technologies that are certainly films made by Maya Deren in the 40s, and studies on the chromomovement photography and cinema made by Muybridge, Marey and Mèliés, all of them need to be considered in the historic route of digital animations systems called "motion capture". In addition, choreographers, researchers and teachers used for some time the cinema and video as an important tool to analyze documents or existing works.

Some software such as "LabanWriter" and "Lifeforms" have been used in the area of dance notation and preservation of dance history, and with the advent of these softwares we can also demonstrate the new possibility to use the computer for the invention and display of new possibilities of movement.

It should be noted the great contribution of Maya Deren to dance, because we believe that the concept of body moving in space/time presented in her film language is like an initial framework of contemporary video dance productions, and subsequently the research in the field of interactive dance. If Loie Fuller (in the late nineteenth century) is like a first matriarch in this path of women in technology in dance, Maya Deren (early twentieth century) is the second most important woman in our registration, followed by Thecla Schphorst (late twentieth century to the present).

Early in the new century, many interests such as films, electronic music, digital art, science and technology, robotics, designated, telecommunications expand our understanding of the process leading new and interdisciplinary research certainly influenced by the emergence of the World Wide Web, the Internet. The performance was enriched not just with new ideas but also with new hardwares such as cameras, video projectors, microphones, sensors, synthesizers and software. As the music had done before, the dance too has been taking possession of this technology, for the creation of movements and choreography now benefit from the programming language, designated, animation and film editing.

Added to that, Clarinda Mac Low research proposes that dance is a communication body-to-body between the dancers and the audience, and continuation, with the use of these new technologies would not be pushing choreographers compete with technology but just showing a way to learning and working with technology and maybe subvert it and use it as art.

We cannot forget to register the choreographer Dawn Stoppiello, one of the creator's team of the software Isadora with Mark Coniglio of Troika Ranch Dance Theater, as another modern matriarch so important in the history of dance and technology, specially her contribution to the development of a choreographic interactive language in dance performances. Stoppiello highlights the importance of interactive systems to meet these available to the largest number of artists interested in an increasingly simple and accessible to anyone with some training and familiarity with the computer. Stoppiello believe that in our generation young people are very close to a generation of computers, as soon as possible we will have an audience to interact in excellent performances and, increasingly, we are combining two seemingly incompatible realms for some people: dance and technology.

Let's look at ways to describe a new aesthetic of interactivity in the dance, of course in dance at one first we need to recognize the context of programming languages and artistic changes made in the digital age, with the possibility of image processing real time. It is one of our difficulties in our country, Brazil, than women, so specified, that our dance students in dance graduation course⁶ have dominated the most basic programming tools and software uses, we can say that in Brazil, in dance area, only now the students start using computers for video editing dances, and other more interactive option that requires deeper knowledge in computer languages. It seems to be only one a frame of a small town, of a specific group of people, but it reveals the whole situation even lived in Brazil, also in South America, if we compare with the possibilities and autonomy that young women have in Europe and the U.S.A.

How to change a trajectory of these female bodies get used to execute the wishes of the choreographers who are mostly men? Bodies are being more feminine and docile since childhood by own dance that domesticate these bodies? The dance is seen in Brazil even as something to embellished and sculpt the female body, and not as a form of expressionist art, rebellious, much less as a way of developing the feminine discourse of

her own body and authority, with few exceptions of recent contemporary dance productions. It is part of our school of Dance role to expand the notion of female corporeality building a more libertarian way, including tools for these bodies to be more independent, supplying ways to construct creative and technological autonomy in order to make a significant change in the former model and greatly strengthened in the countries of South America where most people think that technology is not a field of research for women.

There is still much to write, to fight, to do ... I write this document by Loie Fuller, Maya Deren, Alegra Snyder, Dawn Stoppiello, by Gretchen Schiller, Lygia Clark, Ludmila Pimentel and my artistic partner Mariana Carranza, for all my students, FOR US WOMEN...

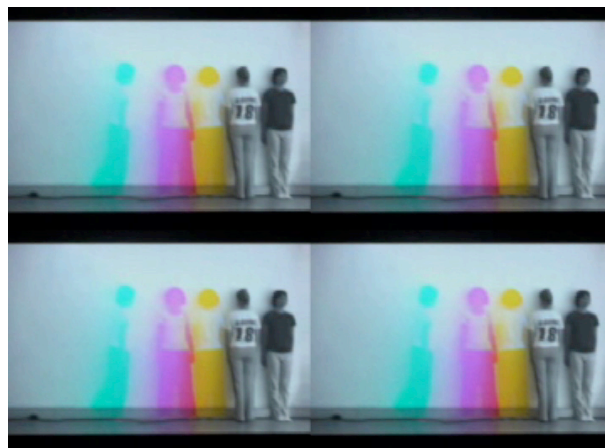


Fig. 1.



Fig. 2.

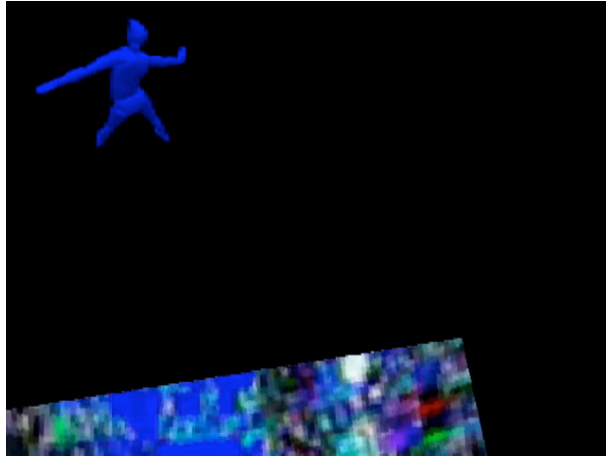


Fig. 3.

Notas

¹ See SCHILLER, Gretchen. *The Kinesfield: A Study of Movement-based interactive and choreographic art*. University of Plymouth, Doctor of Philosophy, Science, Technology and Art Research. School of Computing, Faculty of Technology. England: University of Plymouth, 2003, pp.14-15.

² For Schiller interactive art based on the movement is multifaceted, both may belongs to the sites of dance and technology, interactive arts and cinema dance, in her thesis Schiller proposes that all esses terms are collectively called "mediadance". Mediadance is one of the many forms of art that integrates computer-based technologies, thus is a part of general developments in technologically mediated systems, which include interactive art, interactive art CD-ROM-based, virtual reality, net art, performance, technologically mediated and video games.

³ SNYDER, Allegra Fuller. "Three kinds of Dance Film: A Welcome Clarification", *Dance Magazine*, vol.39, september 1965, pp. 34-39, "The Relationship of Film to Dance" A Report and Analysis of Problems, Needs, Possibilities and Potentials in this Area" (artigo not published by the NEA Dance Program Office, Washington DC, March-June, 1968).

⁴BIRINGER, Johannes. "Dance and Interactivity" [online]. Available at: http://art.ntu.ac.uk/performance_research/biringer/dai.htm [Query: 2005].

⁵ The collective i-Arch bodies is formed by Ludmila Pimentel, Mariana Carranza and Stephan Wolf.

⁶ School of Dance at the Federal University of Bahia, Brazil. Es la primera Escuela de grado en Danza de Brasil, tuvo su fundación en 1956. School is the first degree in Dance from Brazil, had its foundation in 1956.

Figures

Figures 1 and 2. Example of Interactive Digital Choreography, made by participants in the interactive choreography workshop with Isadora and Processing software, offered by the group i-Arch Bodies, TanzImpulse in Munich, and editing images by Ludmila Pimentel and Mariana Carranza (2008).

Fig. 3. Video *memories* of Ludmila Pimentel (2005), made with the software "Lifeforms" and edited in the "iMovie".