



Paulista Invaders: PLAY!

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Introduction

The concept of interaction has become more elaborate, with the human/computer interface being bridged by multimedia structures, where feedback and the retro-activity enabled by computers have become more appropriate for sensitivity and aesthetics. I have investigated the source of the relational aesthetic in some informational artistic systems to see the exchange and interaction between human and machine, and between the machines themselves.

Beyond the approximation of art and science, what also matters is the notion of subject, and the correlation with the dominion of the singular which, according to Mario Costa's sense of the technological sublime (1995), remains stored until it disappears. The individual subject is surpassed by the technological hyper-subject, where individual subjectivities don't matter as much as the subjectivities of the hyper-subject, causing new sublime modalities, provoked by the participation, and posteriorly, by interactivity due to long distance multiple player devices and collaborative projects, as can be seen in the work of game art.

Computer games and computational art have always proceeded together, although with different goals. The paths of technology and interactivity are ones of convergence. In recent years we have witnessed an explosion of work involving the language of videogames in art. The "gamification" of art depended on the advances of techno-science, and one of its emergent characteristic systems, multi-users, in connection with social media. Using gaming language I tried to involve people, system users, in interactive sensations by sharing of virtual spaces in installations

and social networking. I consider that the methodology of creation of game art contemplates contemporary ideas of intervention in political, social, and urban contexts and has theoretical foundations based on computational science, art, and communications.

As an example of game art, or the gamification of art, I will describe some projects that I have been developing,¹ often as a team, since 1997, with the arrival of the language VRML (Virtual Modeling Mackup Language) on the internet, as well as video game engines.

The neologism "game art" began being used in the laboratory to designate artistic work that appropriated the idea of video games, calling upon flexible rules and unconventional narratives. This category of computational art is based on theories originating principally from computer science, art, and communications. Interactivity is a pertinent concept of game art, as it allows for the creation of a culture of numeric interaction, with rules established in 1961 by a group of MIT students, who were doing an initial test of "Spacewar," an electronic game developed inside a multimillion-dollar computer. They wanted to create a type of demonstration, and so came up with a set of rules that the program should follow. The game should:

1. Demonstrate the capabilities of the computer, using almost its full potential.
2. Be interesting and interactive (different each time it is turned on).
3. Involve the user in an interactive and enjoyable way; it should be a game.

These rules are also interesting in the context of art, since it may provoke the insertion of the spectator as a fundamental element in the artistic poetics, without which the piece doesn't exist.

But, more interesting in this new image form is what has become known as Virtual Reality (VR), which is formed by interactive tri-dimensional images. The simulation technique tried to implement the idea of "being there," offering, at least to the eye, what it would have seen if it had actually been there, and more importantly, as the

1 Available at: [HTTP://suzeteventurelli.ida.unb.br](http://suzeteventurelli.ida.unb.br)

image is manipulated, it could be instantly adjust itself to different points of view. Our perception, in these environments of spatial reality, is determined by several forms of visual information such as relative size, reflection and angular movement, and, most importantly for perspective, what allows for stereovision; the way in which each of our eyes sees an image differently. Along with VR, a new and significant revelation comes in the form of intelligent images, brought about by Artificial Intelligence, or AI. AI is used in videogames - principally in interactions between cause and effect - by those who experiment, interpret or explore the games. AI affords us an interchange of experiences and knowledge, of entertainment and relationships; of contemplations and sensations.

AI confers behavior upon the characters of game art, who move along with the movements of the players, interacting by means of a Joystick. According to André Kishimoto,² AI corresponds to the simulation of human intelligence. It is the brains behind the machines, just like in science fiction movies, however for the scientists it is an intimate source of challenges and studies in how to recreate an intelligent being using computers. There are developers who consider the game interface with the player, and algorithms of movement and collision, as an area in the field of AI studies.

Kishimoto cites deterministic AI algorithms, along with movement patterns, used in the very first video games, and composed of random movements, algorithms of pursuit and evasion. In other words, random movements are implemented obtaining a random value and added to the position of a character with similar value. The pursuit algorithm verifies the position of character 1 in relation to the position of character 2, and moves in his direction. The evasion algorithm makes character 1 distance himself from character 2. Thus, the author explains, the movement patterns make the character move in determined patterns: for example, the character may make rounds in a rectangular area.

The author points out that AI for games is complex and there are other techniques that were not discussed which are applied to games, such as the Fussy, A-Life, and flocking algorithms, used to simulate movements of a group of monsters, birds, and

² Available at: http://www.programadoresdejogos.com/trab_academicos/andre_kishimoto.pdf. Accessed December 10, 2012.

fish, among others. Another method has recourse to neural networks, where characters pass through an apprenticeship depending on the player's choices. Other games implement AI through scripts, allowing anyone to create new types of NPC's (non-player characters) or to modify an existing character depending on their playing style. This type of AI (also known as Extensible AI) is strongly based on rule systems. In this sense, we can consider that in several specific moments the aesthetic of communication, where the games also traverse, comes face to face with the technological sublime, making the aesthetic experience shift from the internal to the external. Thus allowing the subject's inner self to experience from external sources, not in the sense that the spirit is objectified, but rather where the spirit is presented as a state of things.

The essence of the artistic product is technologically externalized through the intermediary of the mind/machine interface, in other words by synesthetic machines. In the technological sublime aesthetic, form has little importance, inasmuch as it identifies with concept, with non-form, the random, luck, with the ephemeral, the transitory; that is to say with the flux of ever changing events. This, for us, seems to be the new direction that aesthetic research is taking, under the impetus of computational technology in sound, image, communication, and spatiality, among others.

PLAY! Exhibit

An interesting example of the seductive esthetic of game art was appreciated by whomever passed along São Paulo's FIESP/SESI on the Avenida Paulista, which was transformed into the largest open air digital art gallery in Latin America. That is where the 2013 PLAY! exhibit occurred, turning the city into a stop on the world tour of cities that integrate digital art into their urban fabric, or better yet: they use the term "media facade" to transmit artistic and social "trips." The pyramid like building constructed in 1979 still had its "beehive" façade, but covered with over 100 thousand LED (light emitting diode) lights. This electric chain allows for the transmission of up to 4.3 billion color combinations.

The exhibit was inspired by the video game universe and entitled PLAY! The curator, Marília Pasculli (2013) of Verve Cultural productions, commented that game

art is considered one of the most interesting emerging artistic manifestations at the moment. Not only because it dissolves the boundaries between different art forms - since the "uncouth" form of video game entertainment has reached an important position in the intellectual aesthetic of the artistic world - but also by obtaining an interactive potential, a cultural value that goes beyond the image exhibited in different, non-interactive media.

Following the game theme, the digital art gallery of SESI - again with Verve Cultural - went beyond only exhibiting digital pieces, and opened an area for interaction with the public.

Six pieces of contemporary digital art were transmitted, three of which were interactive (executable games) and three visual (configured in video). Passer-by's on Avenida Paulista during the nights of the exhibit were treated to various aspects of video game history, such as: running games, the shooter aesthetic, labyrinth navigation, the dichotomy of winning and losing, and vision from the third person perspective.

The game "Paulista Invaders", proposed by Midialab, with participation by Suzete Venturelli, Bruno Ribeiro, Fransisco de Paula Barreto and André Bassani Freitas was inspired by the classic "Space Invaders" from 1978. In this case, the game has the theme of sustainability where the space creatures and weapons give way to cars and bikes. On the Avenida Paulista, pedestrians could follow the SESI monitors that taught people to play in real time with an iPad. (Figure 1).



(Fig. 1) The opening of the exhibition with Paulista Invaders. Source: Personal archive

The result was very positive. Interactivity and playability's was possible due to the long distance wifi system that was implemented. Pedestrians watched the game from the other side of the avenue, looking at the side of the building, and using an iPad to communicate with the game in realtime. We must reiterate that the LED panel restricted the game to 168x221 pixels, determining its aesthetic. Nowadays, the aesthetic form is denominated as pixel art, since it is reminiscent of older computer systems and videogame consoles that had limited resolutions. The term pixel art was coined by Adele Goldberg and Robert Flegal in a communication during the ACM event, in 1982 (Association for Computing Machinery: <https://www.acm.org/>). Aesthetically it resembles embroidery, or the weave of basket, or even pointillism in the plastic arts, although the final look is square. The pixel (picture element) is the smallest unit of digital information to which a monitor can attribute a color. On computer monitors pixels are comprised of a union of three colors: green, red and blue.

On modern monitors, each one of these points is capable of exhibiting 256 different shades (equivalent to 8 bits) and by combining the shades of the three points it is then possible to exhibit a little more than 16.7 million different colors (16,777,216). With a resolution of 640 x 480 we have 307,200 pixels; with 800 x 600 we get 480,000 pixels, and with 1024 x 768 we have 786,432 pixels, and so on. The future OLED is above all, an ecological monitor, having greater energy efficiency than current advanced LCD monitors. This is due to the Organic Carbon Compounds (OLED: Organic LED) as opposed to simple metal semi-conductors - with OLED monitors we have for the first time pixels with enough self illumination to shine by themselves, without the need for extra, or indirect illumination (side-light and backlight) as we have with Plasma, LCD, and older Cathode Ray Tubes. Technology also determines computational aesthetics, as one may conclude from this analysis taking into consideration the evolution of monitors.

The online magazine *Galileu*³ commented that it is not just about playing a videogame on the side of a building - which in and of itself would be a disconcerting diversion. Beyond just creating incentive for occupying public spaces, the piece renews the themes of the games, calling attention to urgent topics. "Space Invaders" becomes "Paulista Invaders" and the ships become bicycles - which instead of bullets, shoot flowers at cars in order to keep them at safe distances. A work of art with content like this, at this locale, after an absurd recent accident, is a definite public manifestation, right? With a slight detail: if it were a short film or a text, it would be boring and wouldn't capture the attention of anyone just passing by on the sidewalk.

Another game presented in the exhibition was "LummoBlocks," which allowed for interaction of the participants via body movement sensors (like the Nintendo Wii). The art piece, created in Barcelona, Spain, is a new version of the famous "Tetris" game, where corporal movements are traced and the players become actual pieces in the game. There were another four digital pieces on display besides this.

According to the curator, the exhibition came from the idea that games are becoming a cultural tendency and inserting themselves more and more into urban life. It was also significant as the first showing of open-air interactive game art

3 Available at: <http://revistagalileu.globo.com> Accessed in 2013.

in Brazil. If videogames are seen as an organization of "playing" by way of space on a screen, what then, can this notion of playing offer to public spaces? What is the contribution that the videogame narrative offers to our cultural condition? The artwork included in PLAY! should help to unravel the above questions. The exhibit PLAY! of the digital art gallery of SESI-SP presented the following six works of art, as categorized and described by the curator.

Interactive digital artwork -- using SESI monitors programmed to meet the needs of the game "Paulista Invaders" (2013) - Suzete Venturelli and team Midialab (University of Brasília). The artwork touches upon the ethics of citizenship, focusing on two of São Paulo's main problems: vehicular traffic and air pollution. This real-time game was developed exclusively for the PLAY! exhibit and will be interactive through the use of a tablet. Using as a reference one of the oldest shooter games, the iconic "Space Invaders" developed by Tomohiro Nishikado in 1978, "Paulista Invaders" defends green, sustainable life. This shooter game is structured in two dimensions using a LED platform, where the player controls a bicycle that moves horizontally on the bottom of the screen. In order to defend itself, the bicycle shoots flowers at cars to maintain their distance. The explicit goal of the game is an attempt to humanize the Avenida Paulista, bringing questions of living conditions, health and improving conditions in air pollution into light. It proposes a discussion about the use of bicycles as a form of transport capable of alleviating congestion on the avenues, besides calling into focus the frailty of cyclists who attempt to share space on the street.

Another project, "LummoBlocks" (2010), by the Spanish group Lummo, is reminiscent of "Tetris", the difference being that it is played by pairs of people in the street. The mechanism is similar to the original; however, in this version the players control the pieces with corporal movement, in realtime, through the use of sensors. The facade of the building showed a huge sized "Tetris" game. One player controlled the rotation of the pieces (bricks), and the other controlled where the brick landed using movements parallel to the first player. This game calls for interaction, communication, and collaboration between the players in space terms. The game, therefore, transcends the distinction between the act of playing and everyday life, calling attention to our own urban spaces which may be modified, according to the wishes and collective vision of the citizens.

"Invisible Labyrinths" (2013) by Andrei Thomaz is based on a previous version from 2008, for the web and cellphones using Java, and is inspired by Jorge Luiz Borges' book *The Two Kings and the Two Labyrinths*. The game presents two different play modalities and the players interact using iPads. In the first one, the challenge is to reach the end of a labyrinth, which at the beginning is totally invisible. As the player moves along the labyrinth and bumps into a wall, the wall then becomes visible. However, time is limited, and you can't waste time trying to make the whole labyrinth visible. In the second game mode the labyrinth starts out as visible, but as seconds pass, some walls begin to turn invisible, yet still impede players' movements. Thus, the game becomes harder and harder as the clock continues ticking, since the players no longer see their obstacles and are forced to move based on trial and error. In an almost surreal manner, the game challenges the player's memory to recall the real map of the labyrinth. The iconic nature of the game is a throwback to the popular '80s game "Pac-Man," considered one of the classic videogames of all time.

Other digital visual works in the exhibit included: "Supercut" (2007-2013) by Mark Essen (USA), who created a type of video collage of previous works. Among them; "Nidhogg" (2013), "Basketball Jetpack" (2010), "Tickleplane" (2012) and "Flywrench" (2007). These games combine classic arcade game aesthetics with geometric abstractionism and Op-art. The piece "Dislocated Pixels" (2013) by Alberto Zanella recreated elements of classic games that became precursors to contemporary design and to the collective imaginary, such as "Pac-Man", "Tetris", "Super Mario Bros", "Another World", and "Pong", amongst others. The piece is a sampling, or re-reading of these creatures in situations that are different than where they were always played, and uses vibrant colors and pixelated graphics. It touches on a sense of nostalgia using simple lines and creative alternatives of graphic computing from the '70s and '80s. Curiously, classic games are considered artistic products and a catalogue was recently acquired by MoMA, New York (The Museum of Modern Art, NYC).

The proposal of "The Game Is Over" (2009) from the group Les Liens Invisibles (2013) consists of a video piece constructed from sequences of the videogame "OutRun" (1986) launched on Sega by Yu Suzuk. In the original game, the player drives a red Ferrari, in third person perspective. The car already has a girl in the

passenger seat. They drive along a highway with nice scenery. "OutRun" was one of the first driving simulators which allowed the player to choose routes, which perhaps inspired the artists to choose this game to modify, while still creating hope among people that they might recuperate control over cultural development.

About the artists

It is interesting to note that Alberto Zanella is an art director, a motion graphics designer and 3D animator. He produced animation in the early 1980s (using 8bit computers plugged into TVs and videotape players), and even multiscreen projections in 3D as well as mapped projections. Creator of the Nervous Pixels project, which moves away slightly from the concept of projection mapping on buildings and monuments, it searches for details of the city, places where nobody pays attention to, in an attempt to give personality and call attention to local inhabitants who are abandoned and forgotten. He produces punctual action, such as graffiti Pumpkin and Smiles animated in 3D and projected in reliefs on buildings in São Paulo, for the simple pleasure of creating curiosity and inciting questions.

Andrei Thomaz, from São Paulo, has a masters degree in Visual Arts from ECA/ USP and is a professor at the Instituto Europeo di Design in São Paulo. His artistic production demonstrates a diverse range of digital and analog media, also involving collaborations with other artists, including audio performances and interactive installations. In 2006 he was one of the artists to receive the Fiat Mostra Brasil prize. In 2007 he was an awardee of FUNARTE's Prêmio Atos Visuais, and in 2009 a recipient of the 63rd Salão Paranaense. Along with Daniel Escobar and Marina Camargo, he was awarded FUNARTE's Prêmio de Ocupação dos Espaços in 2010, with the project Places/Representations. He lives and works in São Paulo.

Les Liens Invisibles, from Italy, is composed of artists Clemente Pestelli and Quintini Gionatan. Their work is an eclectic mixture of web pop, reverse engineering techniques, social media subversion and many types of electronic system manipulations. A large portion of their work and online interventions have been internationally exhibited in galleries and museums (MAXXI Rome, New School of New York, KUMU Art Museum of Talinn), and international multimedia art festivals (Venice-Biennale, Piemonte SHARE Festival, Transmediale). They have received honorary

distinction at the Transmediale festival of Art and New Technologies (2011).

In Spain, Lummo was created in 2009, as a collective effort based in Barcelona and comprised of artists Mar Canet, Charles Gutierrez, Jordi Puig and Javier Lloret. The group explores, through interactive and involving experiences, games as a tool to reclaim public space as a place of communication and coexistence. They present multidisciplinary projects constructed by the intersection of areas such as art and technology, media architecture, installations, computer games, etc. They actively participate in several centers directed to production and investigation of digital culture, such as Medialab-Prado in Madrid, Ateleku in Donostia, Hangar in Barcelona and EscuelaLab in Lima.

The American artist Mark Essen is a game designer who applies vanguard cinema values to his videogames. The majority of his games draw upon types of controllers that demand exact precision from the players. He became internationally known in 2007 developing the piece of Game art "Flywrench." Today he is said to be one of the great talents of American contemporary digital art. He is a research professor in the departments Game Lab and Design Media at UCLA (University of California at Los Angeles).

Conclusão

The naturalization of technology allows it to no longer be considered an extension of the body, neither a prosthetic, nor an instrument, but an integrated body, since the brain understands it as part of the body. Artistic production, such as game art, as much as any other, is inserted into a context of human interaction with other activities. Artistic work, more than other forms of expression, are a projection of experience and production of events or artifacts, whose cultural values are recognized as artistic and celebrated as aesthetic. Interactions with other fields of knowledge occur frequently and modify according to the time period. However, the interactions that computational art has with technology today is unprecedented, since the era of global information processing implies webs of connection and interactivity. I believe that this experience has brought about an uncompromised revolution, with radical changes in scientific and artistic topology as results of the

integration of informational processing paradigms and the computational association of our culture, as shown in the pieces of game art analyzed here.

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