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Games and science fiction

Contributing to define hybrid spaces in location-aware games

In *What Is Philosophy?* (1992, p. 137) Gilles Deleuze and Félix Guattari argue that a concept is acquired by "inhabiting, by pitching one's tent, by contracting a habit". That is to say, creating a concept is like creating an "intersection", giving meaning to an undetermined land, hence making a territory. Each culture has its ways of setting up places, therefore creating spatial logics for living grounds. These cultural territorializations articulate knowledge, technologies, narratives, experiences of time and meaning, subjectivity and socialization.

Throughout both eighteenth and nineteenth centuries, improvements in transportation, navigation, and cartographic techniques allowed the mapping of the entire planet, tracing routes . If modern rationalism took only the cartographies of physical and visible spaces, human imagination began to wander about "other spaces". In that sense, Michel Serres assumes that Jules Verne's *Extraordinary Voyages* series marked the end of the era of voyages, since it was no longer possible to wander about unknown places in Earth's terrestrial surface (1977, p. 12-13).

Born precisely in that moment of all terrestrial routes already tracked, Science Fiction sought for new worlds and new possible voyages under different space-time logics as scenarios for its narratives. Dreaming about new spatiotemporal experiences enabled by science and technology, Science Fiction has become a privileged field to explore hybrid spaces. As an example, let's think about several types of hybrid spaces described in SF stories: hyperspace, alternative universes, parallel universes, innerspace (traveling inside human body), time travels, and more.

In the dawn of Information and Communications Technologies (ICTs), Science Fiction guided us through cyberspace creation. Computer simulations, hypertext windows and the Arpanet network already existed as separate phenomena, but science fiction writer William Gibson gave a name and a meaning to those emerging computational technologies, reducing the abstract infinity to finite senses that can be assimilated by our embodied experience/our sensorimotor cognition (Hayles, 1999).

Nowadays, *locative media* combine both geographic and digital spaces. These media assume that spatial perception is crucial to obtaining contextualized

1. In the eighteenth century, Isaac Newton defined physical space as an empty box with three linear dimensions (the x, y and z geometric axes) that always lie in an empty space, finite and continuous, in which solid bodies move through time. As heirs to Newtonian physics, modern thinkers believed that reality was entirely expressed in physical space. Margaret Wertheim explains that, in the Newtonian era, "the physical world is the totality of reality because within this vision physical space extends infinitely in all directions, taking up all available, and even conceivable territory" (1999, p. 33).

information (Boa-Ventura, 2006), allowing interaction with elements of the environment, as well as their use in different contexts. This change in the concept of space occurring through localizing, classifying, archiving, and using information is seen as somewhat relevant (Galloway, 2005; Ward, 2005).

Locative media allow the creation of games combining geographical space exploration with the use of mobile digital technologies like cell phones and GPS devices; these are location-aware games. These games make daily life objects and spaces become "communication machines, trading information and identifying objects/people and movements" (Lemos, 2007, p. 9), to create ludic experiences that can be experienced individually or within a group. Integrating both geographic and digital spaces, real and fictional environments, the *location-aware games* instigate us to redefine game spaces.

Seeing Science Fiction as a privileged field for hybrid spaces exploration, the main goal of this paper is to demonstrate how hybrid spaces created by location-aware games are like heterotopic spaces—so common in SF stories. The development of this text is divided into three parts. First, we shall highlight the way in which the cyberspace became a space of communication, data exploration and social interactivity through the Graphical User Interfaces (GUIs). In the second part, we shall discuss how location-aware games articulate both digital and physical worlds. Finally, we shall understand the concept of heterotopias, and how Science Fiction is enabling us to explore and understand hybrid spaces, thus contributing to the understanding of spaces in location-aware games.

THE INFORMATION SPACE

Since their beginning, ICTs have demonstrated a potential to defy petrified concepts of space. The cyberspace, the communication networks, and virtual reality cannot be reduced to simple prostheses, tools, or sensorial extensions. In providing new possibilities for environment interaction, these information technologies stimulate and require new abilities from our sensorial/cognitive systems; therefore ICTs carry out some reconfigurations of our physical, sensorial and cognitive capacities, resizing the spatialization and thus the limits *ofthinking, embodiment* and *space* itself (Regis, 2002).

As postulated by Steven Johnson, cyberspace and interactive simulations (e.g. the virtual reality) offer the notion of *space* as a ready-to-explore environment (Johnson, 2001, p. 23). We know that digital media have this paradoxical feature: we need a proactive behaviour to enjoy their possibilities (a striking difference regarding mass media) but the user cannot make use of this information directly, as Johnson explains:

> A computer thinks—if thinking is the right word for it—in tiny pulses of electricity representing either an "on" or an "off" state, a zero or a one. Humans think in words, concepts, images, sounds, associations. A computer that does nothing but manipulate sequences of zeros and ones is nothing but an exceptionally inefficient adding machine. For the magic of the digital revolution to take place, a computer

> must also represent itself to the user, in a language that the user understands. (Johnson, 2001, p. 17)

Through the development of computational devices, these needed representations became the graphical user interface, evolving from the complex programming strings to a visual, metaphorical system. Computation has became more and more image-related, creating what Johnson identifies as an "information-space", an old-fashioned technique of mind information storage based on the organization of human mind, which gives privileges to the visual memory, more enduring than textual memory. As said by Lev Manovich (2001), that organization of space for representing or visualizing something is not exclusive to GUIs, being just one more of the cultural features transposed to digital media, since it always was a technique of human practices, used in different fields of knowledge like Architecture, Urbanism, Geometry and Topology.

GUIs started having spatial attributes when the graphical representation of information began to be built through bitmapping techniques; thus we had the illusion of exploring virtual environments, leading to construct systems that allow users a "direct" manipulation of data, which is represented through images and icons (Perani, 2007). This is precisely the concept behind terms such as Lev Manovich's (2001) "image-interface"—building information which is not only an image, but also information that has to be manipulated, a proactive behavior needed from every digital media user for the structuring and enjoyment of these media. Therefore, "So that the information-space illusion functioned, we had to be able to make our hands dirty, to move things from a side to the other, to make things happen" (Johnson, 2001, p. 21). That environment exploration ability is considered one of the features most desired by interface designers, since it would lead to better knowledge of system, allowing its use with greater awareness and enjoyment (Perani, 2007).

The spatial information held by computing devices quickly became a cultural trend that has come to define our relationship with these media. The same navigation metaphors and interfaces started being used for several purposes, such as scientific data analysis or entertainment (Manovich, 2001), and with the popularization of computer networks, since the 1980s virtual environments have started to give name to groups of people who had the same interests, like the virtual communities. Spatial metaphors (e.g. the word "navigation") have begun to make reference to different methods of information organization and access (Manovich, 2001). This *téchne kybernetiké* has originated the word cyberspace, created by Sci-Fi writer William Gibson in his classic book *Neuromancer* (Gibson, 1984) to define these new interactive spaces. But the presence of a cyberspace discourse does not mean that we adopted, for this work, utopias of "pure connectivity" environments, which would lead to an escape from the flesh and to the dematerialization of the mind, an issue of early Cyberculture studies referring to religious discourses of (re)connections with information and transcendental possibilities through ICT usage (Dery, 1996; Wertheim, 1999; Grau, 2007). So even

if *Neuromancer* is a satire of utopias of dematerialization in computer-mediated spaces (Grau, 2007), we believe that Gibson possessed a unique sensibility in order to capture the spirit of digital technologies: the spatialization of information which generates explorable environments through user actions.

In Gibson's book, Case, the main hero, has his neural impulses connected directly to the computer through electrodes. According to Hayles (1999, pp. 38-9), Gibson creates two literary innovations that allow human mind to act directly upon abstract data; the first innovation is a subtle modification in the point of view (p.o.v.) notion—in *Neuromancer*, the p.o.v. is the subjectivity of the character, which works as a position mark (cursor) for his absent body. The second innovation in *Neuromancer* is transformation of the data matrix of cyberspace into a stage in which a story can be developed. The narrative becomes possible when the p.o.v. travels through the created landscapes, giving a sense of temporality to the story. Reduced to a dot, the p.o.v. is a purely temporal entity without material extensions; metaphorized as an interactive space, the *datascape* receives a narrative due to the p.o.v.'s movement through it.

Gibson's work fills the cyberspace with subjectivity, spatiality and temporality. This reduces the abstract infinity into finite terms that can be grasped by bodily experiences and the sensorimotor cognition. The 1982 movie *Tron* by Steven Linsberger had already created something similar, but is no coincidence that *Neuromancer* was released in 1984, the same release year of the Apple Macintosh, the first widely sold personal computer with an embedded graphical interface.

Besides making computer devices more accessible to the public consumption and building a powerful cultural trend, developing the concept of information-space has also a more pragmatic purpose: organizing the large scale of data we receive from digital devices and the interconnections of computer networks (Johnson, 2001). In that sense, when we talk about spatial constructions we can refer to cartographic metaphors, since this would be a work of mapping such as those described above: a search for unspecified elements, trying to establish connections between similar patterns, and their subsequent arrangement in a spatial structure. Just because of the overload of given information, we must recognize that "There is an increasing need for an aesthetic structuring of knowledge, which will allow the data to be presented in a form that is transparent, manageable, and manipulable" (Grau, 2007, p. 248).

LOCATION-AWARE GAMES: ARTICULATING BOTH DIGITAL AND PHYSICAL WORLDS

We shall remember that constructing an interactive virtual environment is not the only change in the notion of space brought to us by ICTs. In the 2000s, a new technique of spatial representation through digital media has arisen, using preexisting urban spaces and at the same time amplifying them. The *location-aware games* combine the exploration of geographic spaces with the use of mobile technologies, such as mobile phones and GPS, making objects and spaces

"communicational machines, exchanging information and identifying objects/people and movements" (Lemos, 2007, p. 9), creating playful experiences which can be experienced individually or within a group. Thus the notion of spatiality is a main idea in our studies, connected to the concept of locative media; essential tools to develop these games, locative media lead to the idea that spatial consciousness is a main attribute for obtaining contextualized information (Boa-Ventura, 2006), allowing interaction with environment features as well as its use in different situations from the original context. The spatial transformation from these types of communication media happens through localization, classification, storage, and the use of (considered somehow) relevant information (Galloway & Ward, 2005). Relating to that scenario, we can associate locative media to *Star Trek*'s tricorder device (1966)—when pointed to any object, the tricorder offers information about it to crewmembers.

These characteristics clearly demonstrate the connections between locative media, ludic theories and Science Fiction, since games allow the construction of an aesthetic experience, which is lived outside of the daily life, starting from a space-time "separation" which brings us the need of assimilating the rules of that parallel universe. The "isolation" of time and space made by the game action is activated when the rules are defined: with these regulations, which are mandatory for the players, use of spaces, duration, limitations and possible actions are delineated. According to Steven Johnson:

> And one of the things that make all games so engaging to us is that they have rules. In traditional games like Monopoly or go or chess, the fun of the game —the play— is what happens when you explore the space of possibilities defined by the rules. Without rules, you have something closer to pure improv theater, where anything can happen at any time. Rules give games their structure, and without that structure, there's no game. (Johnson, 2003, p. 134)

We know the ludic, as well as art, "has the power to impose its own assumptions by setting the human community into new relationships and postures" (McLuhan, 2003, p. 272), since it involves a different setting of space and time, with specific conventions and possibilities that only exist within the game. That game-driven experience needs a proactive stance from the player which can imply explorations, appropriations and/or the resignification of habits, abilities and information, features used by locative media to develop new possibilities of fruition for users through location-awaregames.

In this specific case, players become aware of the rules that drive this ludic activity through locative devices, which offer mandatory affordances at the beginning of environment explorations. We also know from theories of ludic activities that the perception of *affordances*, a cognitive trait for apprehending and comprehending a certain environment, is an extremely important tool for human development and the acquisition of knowledge and life experiences. As said by Jesper Juul, "the rules of a game also *set up potential actions*, actions that are meaningful inside the game but meaningless outside... Rules specify

limitation and *affordances*" (Juul, 2005, p. 58). Therefore, with the possibilities of environment interaction provided by locative media, the player can initiate a playful exploration, learning from game spaces, detecting essential information, sorting out and selecting options.

The alleged difference between "traditional" non-electronic games and video (digital) games is that, in the former, rules are described for the player at the beginning, and such a thing would not be possible in digital media, in which players have to explore the virtual environment until discovering the rules of the game (Juul, 2005; Johnson, 2005). That is also the logic behind location-aware games, which use locative devices as points of connection between players and the hidden rules. Thus, interacting with space in order to obtain contextualized information of a given game is also the acquisition of its constituent rules. However, we shall observe a certain difference in the proposition brought to us by location-aware games: even if the set of rules of that ludic experience is hidden, just as in the "regular" electronic games, players shall discover them through the interaction with the physical environment that surround them, that is interacting with the streets, buildings and people, all transformed in elements within the proposed experience.

This reinforces the sensation of a hybrid activity that employs several common features to a variety of games, either electronic or traditional. The hardware of location-aware games is not only the electronic medium, which gives *entry points* to the game action, but also the physical space in which they are being played. These games contribute to valorizing the experience with the physical space, even if that experience is mediated by locative digital devices. Instead of dematerialization theories, created at the dawn of cyberculture discourses, we have a construction of a hybrid space where information provided by the physical environment has the same importance as virtual data.

SCIENCE FICTION SPACES, HETEROTOPIAS AND THE LOCATION-AWARE GAMES

One of the main features of the Science Fiction genre is the creation of exotic spaces for narrative development. These are hybrid spaces frequently constituted by spatiotemporal logics that defy our perception.

A classic Sci-Fi theme is that of adventures within huge intergalactic empires. These sorts of narratives describe two kinds of unusual spaces at least: alien planets and interplanetary space. Exotic alien spaces are originated by astrophysics and geographical conditions of the planets in which narratives are developed. Climatic conditions, gravitational forces, and multiple suns are some of the aspects that define alien forms of life with distinct body parts, beliefs, habits and territories. Yet for space travel to be possible, the barrier of the velocity of light, imposed by the Theory of Relativity, has to be defeated, thus leading Sci-Fi authors to imagine fictional spaces. The writers of the genre borrowed the term hyperspacefrom Mathematics and gave it other signification. As said by Clute and Nicholls, *hyperspace* is "In sf terminology, a kind of specialized

2. According to the Human-Computer Interaction (HCI) theory, entry points are elements that "invite" users to experience a certain system (Rogers, 2004). In this work, we shall think of entry points as the elements that help users to discovery and play roles in a location-aware game.

space through which spaceships can take a short cut in order to get rapidly from one point in "normal" space to another far distant" (1995, p. 607). Hyperspace is commonly understood as a space from another dimension in which our three-dimensional space can be folded—like a sheet of paper—getting two distant points to be in a direct contact. Just like several other Sci-Fi concepts, the *hyperspace* word was largely incorporated to its terminology and is free of further explanation within readers and writers.

Another very common type of space in Sci-Fi works is represented by the *alternate world* narratives: "is an account of Earth as it might have become in consequence of some hypothetical alteration in history" (Clute & Nicholls, 1995, p. 23). Those are histories that think about "what would happen if…". When several alternative universes coexist simultaneously, interacting sometimes within them, then a *parallel world story* is created.

The possibilities of narratives about microscopic and inside spaces were also considered by the creative minds of Sci-Fi writers. The tendency of *innerspace* voyages, propagated by the *New Wave* trend (during the 1960s and 1970s), has motivated the inner exploration of the human body. In the *Fantastic Voyage* film (Fleischer, 1966), a group of scientists invented a machine capable of miniaturizing humans and objects.

For those moved by the desire of knowing and controlling the reality that surround us, no theme would be more seductive than *time travel*. Science Fiction does not invented time travel stories, but their endless narrative possibilities are always seducing their writers and readers. One of the main plots of time travel stories is the temporal paradox, a temporal disturbance in the time flux caused accidentally or purposefully by a time traveler. For instance, if a person returns to the past and meets his/her grandfather when a child and kills him, how would that person be alive and time traveling to kill his/her grandfather?

Thus, the different perspectives revealed by Science Fiction have been developing a new comprehension on spatiotemporal configurations in its fans. For the Sci-Fi, the universe is a heterotopic space. To fully understand the meaning of this expression, we shall seek for the ideas of Michel Foucault, who defines and differentiates heterotopias from utopias in *Of Other Spaces: Utopias and Heterotopias* (2001). The French philosopher describes utopias as idealized spaces which are created from real spaces of the society, but utopias are unreal and do not have a localization within the society. The heterotopias are real places, some sort of counter-places, a utopia effectively created in which every real place, every other place found in the midst of a culture can be represented, criticized and inverted—simultaneously. Heterotopias get every place together immediately. They are everywhere and nowhere at the same time. Frequently, heterotopias are also heterochronisms: they reunite various times all at once.

Foucault describes some examples and principles of heterotopias. Here we shall emphasize the third principle: heterotopia has the power of making juxtapositions of various places and various positions that can even be incompatible:

> Thus on the rectangle of its stage, the theater alternates as a series of places that are alien to each other; thus the cinema appears as a very curious rectangular hall, at the back of which a three-dimensional space is projected onto a two-dimensional screen. (Foucault, 2001, p. 418)

The heterotopic feature of Science Fiction has been noted by its scholars and critics. Besides the word *heterotopia*, all of Sci-Fi's *other spaces* can be explained by the concepts of zone and *paraspace*. In *Postmodernist Fiction*, Brian McHale assumes that postmodernist fiction resembles Sci-Fi writings. McHale argues that in postmodernist fiction "Being is centered, as the status of the world and existence become defining issues. Postmodern fiction stages a dissolution of ontological boundaries, presenting a collision and shifting of words" (Bukatman, 1998, p. 162). This world is not identical to itself, and it does not exist as a homogeneous place with a permanent meaning. The space that allows the multiplicity of worlds is called Zone, a word chosen because of its importance to Science Fiction. In William Burroughs's space age mythology, *Interzone* is the place where everything is allowed and coexists (1987). In *Stalker*, a romance adapted to film by Andrei Tarkovsky in 1979, Zone is the mysterious place for alien visits. In the Zone, "a large number of fragmentary possible worlds coexist in an impossible space" and if that space contains allusions to historical places (Ohio, Latin America, occupied Germany), it "in fact is located nowhere but in the written text itself" (Bukatman, 1998, p. 164). That definition seems to be adequate for the kind of space generated by location-aware games, yet the "nowhere" that was exclusive to the written text now exists in the informational space.

The Sci-Fi writer and critic Samuel Delany created the term paraspace to make references to the "science fictional space that exists parallel to the normal space of the diegesis" (Delany, 1988, p. 30). Delany argues that the notion of exotic places (outer space, future) is endemic in the genre.

So the concepts of *Heterotopia*, *Zone* and *Paraspace* seems to be appropriate for initiating a discussion about new hybrid spaces shaped by location-aware games, here approached as a common sample of the peculiar time-space configurations brought to us by ICTs. Science Fiction, as a well-adapted narrative genre for the study of heterotopic spaces, demonstrates its capacity to serve as an instrument for comprehending novel perceptive and sensorial structures, and also comprehending new spatiotemporal logics of ICTs and location-aware games in particular.

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