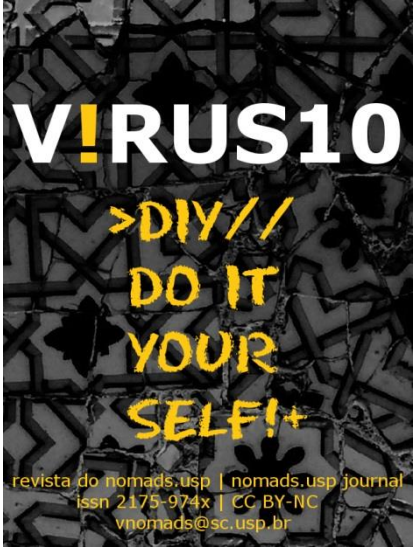

Punk rock, games and digital design: Proactive and collaborative attitudes for the twenty-first century architecture. Gilfranco Alves and Anja Pratschke

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Abstract

This paper presents a specific aspect of the PhD research called *Cybersemiotics and Design Processes: Methodology in Review*, accomplished at the end of 2014 at the Graduate Studies Program of the Institute of Architecture and Urbanism (IAU), University of Sao Paulo (USP). The PhD research was funded by FAPESP, and is also linked to the Nomads.usp research group of the University of Sao Paulo (USP). The paper discusses aspects of digital design processes within an approach on social collaboration with digital mediation, from concepts based on Actor Network Theory, developed by the French philosopher Bruno Latour. The paper aims to examine collaborative procedures and hybrid methods of design involving multiple actors or players, searching to redefine the possibilities of conception in Architecture with a bottom-up approach, considering the concept of Do It Yourself (DIY) and digital games applied to digital design processes.

Keywords: Cybersemiotics, Digital Games, Do It Yourself, Digital Design Processes, Actor-Network Theory

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First Chords

The Do It Yourself Movement (DIY) may have several origins. The one we would like to approach lies in the underground punk scene in the mid-1970s, both in the United States and England. In the current musical universe in these countries, it was the era of progressive rock and technical exuberance, where experimentalism and virtuous solos seemed wanting to postpone the end of songs to infinity, both in live performances as in the recordings in vinyl. Rock bands, classics at that moment, configured a hierarchical system where the most famous ones were catapulted to a world of fame and stardom: the Rockstars. In this scenario, some young people who in principle had no sophisticated musical skills – but with a lot of attitude and initiative – began to wield their instruments and express their ideas, anguishes and above all, their protests stuffed with anarchism against the established system. It thus spread the culture of DIY, which included not only the creation, execution, recording and distribution of songs, but the whole production, pre- and post-concert, besides the manufacture of the bands promotional material, posters, booklets, fanzines and often even the cover of albums and k-7 tapes, the famous demo tapes.

Several bands such as The Ramones (Figure 1), Television, Talking Heads and Blondie marked this phase in the United States, while in England we can mention Sex Pistols, The Clash, The Damned and Buzzcocks, among others.

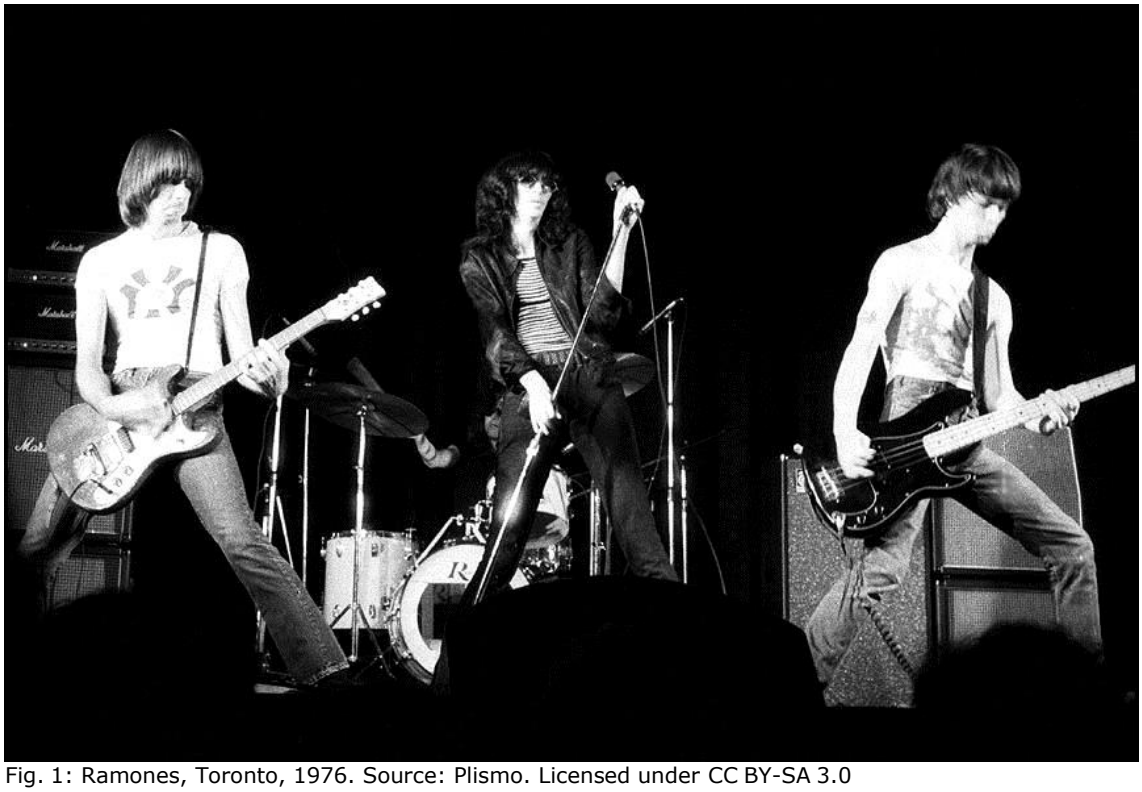

Fig. 1: Ramones, Toronto, 1976. Source: Plismo. Licensed under CC BY-SA 3.0

This culture has not been lost over time and even though it was attacked by a certain period of lethargy funded by record business, major labels, and radios that dominated the music industry, we find at different moments in musical history initiatives that preserved the Do It Yourself attitude. In Brazil, more recently, the non-governmental organization Fora do Eixo was presented as a very creative

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alternative in order to support the independent movements and fostering the alternative music scene throughout the country, by means of festivals, concert tours, gigs and self-sustaining collective funding. These collaborative networks, which had already proved to be the basis of the underground scene in punk rock, have now a much broader reach by using the Internet and the possible connections with the currently available technologies.

But what architecture has to do with it?

In principle, production relations between DIY and architecture may have some parallels. A brief look towards the end of the nineteenth century shows us, from handmade creation of the Arts and Crafts movement to serial production proposal to the industrial revolution, two extremes. These extremes point to a crisis of processes that were either customized and only a few had access, or were implemented in large-scale reaching a larger audience, increasing the financial benefits arising from with mass repetition. This latter situation remained virtually throughout the twentieth century, eventually leading to well known social and urban problems, which will not be covered in this paper following its limits. However, with the recent enhancement of digital mediation and network connections, the evolution of digital design and the possibilities offered by digital fabrication begin to change this framework, enabling the Do It Yourself to be revisited, now with the technology to be at the same time, handmade, fabricated on a large scale and collaborative.

Digital fabrication: large-scale customization

In general, the digital fabrication techniques applied to architecture are very recent when compared to the history of architecture itself, with its beginning standing at the turn of the twentieth century to the twenty-first century, as pointed out by authors such as Dunn (2012). According to Orciuoli and Celani (2010), "the digital fabrication techniques can be classified into three categories: additive, subtractive and formative.". These fabrication techniques allow digital files to be sent directly from the computer to the production machines, such as the robot Kuka (Figure 2). Also known as *file-to-factory*, this process requires new attitudes in the processes of design and manipulation of information. It shifts the focus from representation, as it was done in the drawing by hand, to performance, in order to program performance and modeling objects and architectural elements the way as they will be effectively produced, thereby reducing the possibility of abstractions and interpretations.

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Fig. 2: Kuka Robot, IAAC Barcelona. Photo: G. Alves, 2013.

According to Kas Oosterhuis, architect and coordinator of Hyperbody research group at TU Delft, in the Netherlands, digital fabrication technologies allow us to move forward on the modernist paradigm of mass production:

> Now we have a different technology. We have technology to customize, so, to produce series of unique objects, of unique components. There is no way to justify that all elements in a building are the same. There is no justification for having a window that is repeating. Or having a column that is repeating, or anything - Chairs! No reason! Because production masses, actually, are open to varying parameters during the production process. We can produce series of unique components. (Oosterhuis, cited ALVES, 2013).

In this sense, the process update made possible by technology allows us to have custom elements being produced in series, which breaks somehow the paradigm of increase in the production scale by repetition that prevailed throughout the twentieth century.

Furthermore, from the perspective of the design process in architecture, there is the fully developed possibility of three-dimensional representation from physical scale models or prototypes. The prototypes fulfill the important function of providing a design representation, which is very similar to the architectural object itself to be built in the future, with aspects of materiality and performance that allow the anticipation of the object, from a very consistent sign to the human brain. "A sign or *representamen*, is all that, in a sense or measure, exists for someone in place of something." (PEIRCE cited NOTH 2003 p. 65). Therefore, we can say that digital design associated with prototyping and digital fabrication possibilities allow a potentiation of building techniques and enable the development of architectural design, as a sign of the work to be produced.

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Networked actors and the collaboration amidst multiple agents

As pointed out in Alves (2014) and Alves and Pratschke (2014), digital design can acquire interactive qualities and, therefore, express increasingly collective demands. While perhaps a fully bottom-up strategy is never reached, due to our intuitive ability and also because at some point there must be a responsible of the decision-making, we believe that as those processes become less top-down, we will be taking a big step towards more interactive processes, more committed to collective socio-cultural values.

The Actor-Network Theory (ANT) emerged in the mid-1980s, especially with the work of philosophers like Bruno Latour, Michel Callon and John Law. ANT is a conceptual framework proposing to explore socio-technical collective processes, whose researchers have been specially focusing on science and technological activity. Based on the study of technology, ANT suggests that the work of science is not fundamentally different from other social activities, but it is a heterogeneous process in which the social, technical, conceptual and textual work together, being transformed or translated (LATOUR, 2005).

According to Nobre and Pedro (2010), the Latour's Actor-Network Theory proposes that daily practices involve science, technology and society, and also that the moorings between humans and non-humans form a web of networks that break any strength in microconnections. Following the philosopher John Law (1992), the social is nothing more than a set of heterogeneous materials networks. The circulation in the network frames occurs through hybridizations or translations, and within these various displacements processes a reality is produced. Therefore, all technological artifacts (non-human), and then we can include architecture, have a social importance in function of the translations they enable, and thus the analysis of networks must gain both social and technical perspectives.

Rheingantz et. al (2012) point that the Latour understanding of network mixes the human and non-human actors dissolving the human mastery on facts/artifacts:

> The place is life, the movement of people and events. Each move establishes new relationships, and so on. The architecture can no longer be understood in its entirety by excluding factors external to the object. The building is itself the change, the triggering element of an urban transformation. The architectural object highlights, all the time, the passage of time and the characteristic movement of the dynamics of life (RHEINGANTZ et. Al 2012, p. 24).

Therefore, the ANT offers a free acting, compatible with the concept of self-organization, which makes it easier to find order after having allowed the multiple actors or actuators to deploy a whole range of disputes in which they are immersed.

The architect Kas Oosterhuis has been working for several years in the development of non-standard architectures with strategies involving design in networks of interaction and responsiveness. Oosterhuis says that in a collaborative process network agents act as a birds swarm, where each agent is a node in an interconnected network, playing following a specific rule, and thereby producing a flow of multidirectional information network, i.e., a multiple agents system.

This process oriented to information or to the exchange of information from references, can be grounded in the Bruno Latour Actor-Network Theory in order to construct a method for digital design. According to Oosterhuis, this way of defining the digital design process based on Actor-Network Theory requires a different attitude, as one should understand that everything in principle is dynamic and not static..

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> You must feel that inner evolution. Because everything evolves. Your design evolves, situation evolves, everything evolves. So you work inside evolution. Again, like a bird in a swarm which can only act inside the swarm, it cannot act alone. Like you with your brain, you cannot act alone, because your brains are useless if they are not connected to other brains. You would not even think. You would not even see anything. Because the whole way it evolved is based on connectivity, everything is based on connectivity in the end. And bidirectional, in the question, is only between two points but of course it's multidirectional, because there are many players, many types of interacting components, interacting swarms, interacting groups. But that's the complexity that comes about when you start from within, so you have to dive inside, start from there, define your rules and then, work from there. (OOSTERHUIS, apud ALVES 2013).

A design process is thus stablished in which the design itself may be represented by numbers and, at the same time, be influenced by them. In a performance-oriented process, the reality is provided and not merely observed. For Yang (2008),

> "Multi-Agent Systems are systems composed of several autonomous agents. These agents may use belief-desire-intention model or other mechanisms to guide behaviours, respond to the environment, or communicate and interact with other agents." (YANG, 2008 p. 10).

According to Oosterhuis and Jaskiewicz (2007), design in architecture is an interactive game whose goal is to create a building. It is a game in which architects must play following rules of physics, economy and society, for example. Also according to the authors, design is naturally a multiplayer game, in which many experts must work together to improve their prospects of winning.

For the authors, more important than all technical questions about how to make things work, is to define the mode of designing these strategies pressupose:

> "Computers let us play together in real time. In a multiplayer game, the exchange of information happens instantly, many cycles per second. What will happen if design information gets exchanged immediately between different designers?" (OOSTERHUIS and EJASKIEWITZ, 2007. p. 359).

We speculate that probably there will be changes in the methodology involving design process. Also probably, simultaneously to intuitive top-down contributions in each of the subsystems, there will be many levels of bottom-up collaboration in the system as a whole.

Designing while playing. Playing while designing

In order to pursue our discussion, it seems relevant to ask: what would we gain by using digital games for architectural proposals? According to Hovestadt (2007), the architectural discourse still present at the beginning of XXI century is based on outdated conceptions of technological realities. The author points out that many attempts by architects and game designers to generate hypotheses and theorizing about architectural games were often superficially explored and presented. So this became an argument for more conservative architects to classify them as an "amateur genre". We know however that, through game experimentations, effective methods and technologies to more complex and dynamic system modeling, control and interaction were developed. Such systems can often achieve and simulate much better than it would be possible in everyday architectural practice.

For the author, computer games emerged in the context of scientific research at a time when computers were still unable to generate virtual spaces. Subsequently, the spaces formed by computers were mainly focused on the physical nature of spaces in search of representing certain levels of reality. More recently, from the

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possibilities promoted by networked connections and especially by Internet, games also won an interactive dimension, not only with the digital environment, but with the opportunities offered to multiple players. Interactivity capabilities increasingly pervasive and ubiquitous were also increased as a consequence of the development of technology directed specifically to digital games.

The evolution of both consoles as the games provided a huge and sophisticated range of levels of representation, moving to 3D in digital environments, which began to simulate the physical reality in these environments. It also represents a jump in the characteristic of the games, from an individual level to a collective level, including relations not only with architecture but also urbanism. Let us examine some examples.

SimCity (Figure 3), by *Maxis*, launched in 1989, is an important game because it represents a step forward in the transition of an entertainment game for a planning game, whose strategies include actions that simulate the behavior of multiple actors and cities.

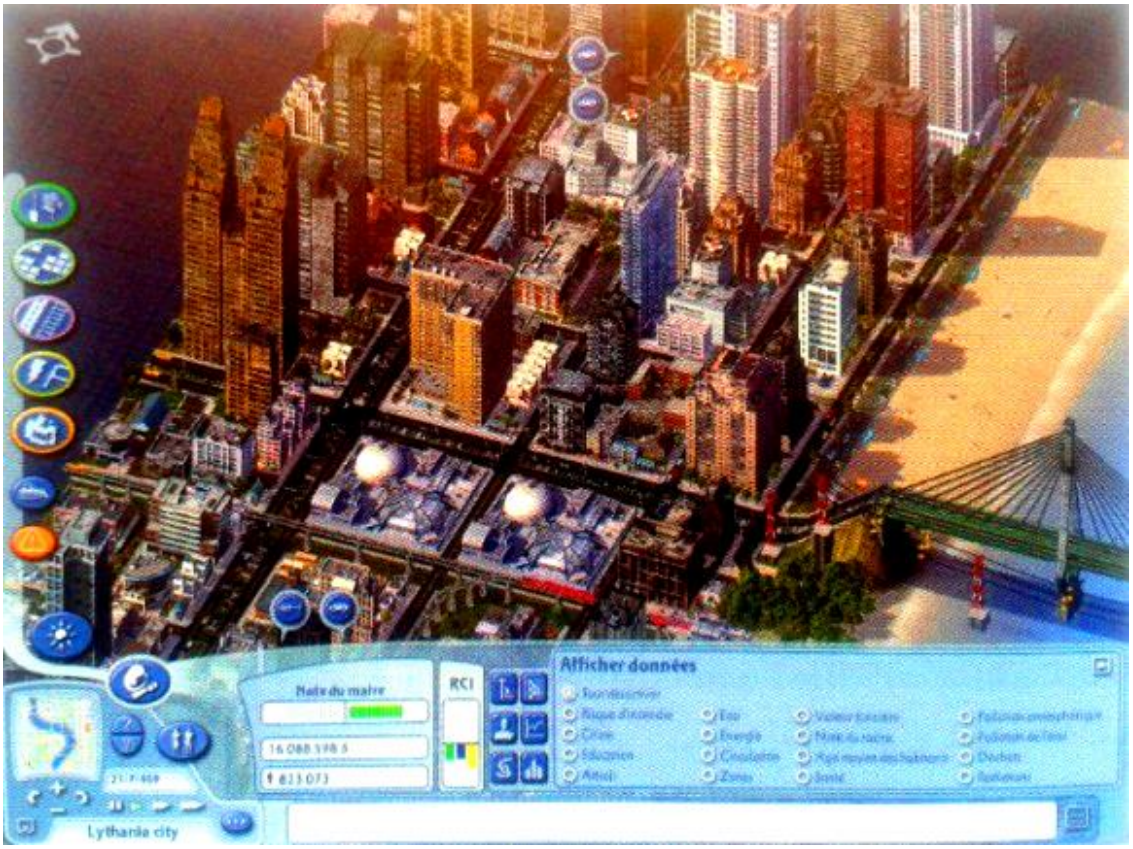

Fig. 3: SimCity. Source: Borries et al., 2006.

SimCity demonstrates the fundamental need to observe and interact with systems, enabling players to test theories and build mental models. It has been designed from important references as Professor Jay Forrester at MIT, author of Urban Dynamics (Dynamic Urban), and as the architect and mathematician Christopher Alexander, especially in his essay The City Is Not a Tree. In this work, Alexander argues that in the city, a tree-type standard is divided into several individual sections or regions and that, instead of this premise, the sections overlap and interrelate with each other dynamically. Therefore, *SimCity* expressed a desire to influence, from the planning, both politics and education, feeding the reflection on the nature of ideal cities. (LOBO, 2007).

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Another similar game, which arose from *SimCity* and deserves quotation, is *The Sims* (Figure 4) also by *Maxis*, launched in 2000, which allows players to create a neighborhood with simulated residents and then to manipulate their lives. The players goal is to act as maintainers of households they create, participating in various daily activities of a typical inhabitant of an American suburb, for example, going shopping, eating and sleeping.

Fig. 4: The Sims. Source: Borries et al., 2006.

The possible space of manipulation follows in many ways the very North American logic of use and occupation of space. You must build your own home and can even opt for destroying existing buildings, becoming literally bulldozer in these lots (FLANAGAN, 2007), which we earnestly desire, is not the goal of the planner or player.

Currently, *Minecraft* (Figure 5), created by Markus Persson for the *Xbox* platform, which is being developed by the University of Southern California's School of Architecture in a version that promises to enhance the ability to plan a city, offers greater collaborative participation among users. It is an example of how games can simulate more dynamic and interactive situations within digital design.

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Fig. 5: *MINECRAFT FOR REAL LIFE*. Source: http://www.fastcoexist.com/3034872/minecraft-for-real-life-this-video-game-wants-to-help-redesign-actual-cities#3

Undoubtely, the condition to face new challenges and take risks in a playful way provides another approach, where tests can be implemented to feed back into the process and communication levels between participants can be deepened. From this approach results an interaction with the environment, and therefore with the cities, changing the experience of citizens, not only as users of space but also as co-designers of the experiences that can be provided. In an interview to the editors of "*Space Time Play*" William Mitchell talks about this issue:

> These technologies create a new relationship between the city and its users. They create a new narrative of the city. And I tend to think that these narratives that unfold as you move through the city and the narratives that are mapped onto the city are very important to urban design. Narratives make the city. [...] So I think the relation between new game technologies and space is very important. In the future, location-based and pervasive games will create a new kind of a narrative structure in urban space, and location-based devices will map the narrative down on the space of the city in very interesting ways. (MITCHELL, 2007. p. 408.)

We can assume that when Mitchell speaks about new relationships between the city and its users, he could also be talking about an enhancement of the levels of citizen participation in decision-making related to ways spaces could or should be designed and managed by the community. In a hybrid environment, the virtual world permeates the physical world and the physical world permeates the virtual world, creating hybrid areas of ambiguity. They may prove to be very interesting in terms of conflict and demands that may emerge from bottom-up approaches, in case, obviously, that this is the concern of those planning the spaces.

Normally games operate within the same principle: they are technical demonstrations that describe ways to think, reflect choices and, as a rule, are more powerful and adaptable then the available construction techniques, as these latter often remain in the same status without update or evolution of performance after reaching a certain quality threshold. (HOVESTADT, 2007). This situation could lead to some accommodation with respect to users, just by not proposing challenges. Instead, in a simulated situation, the limits can be expanded by the interactive condition of hybrid models.

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Our interest is in the study and development of systems that enable mutual benefit through which architectural possibilities may be connected to games modeling, collaborative production and patterns of interaction among users. These interfaces could be made available for everyday use of architectural firms, but we know that deepen levels of interaction requires a significant amount of work, training and patience so that the process can be understood and as a result, evolve. Again, it is a matter of mindset change and posture.

Ending the jam session

Firstly, it is important to highlight that the Do It Yourself or DIY has to do with attitude. It's about changing a mindset, from accommodation to action. Following, we conclude analogously that, like in punk rock, digital design allow an expansion in the scope of activities of architects and designers where they can act directly. Such activities range from the configuration of design itself (*metadesign*) based on scripts programming that add parameters in the initial project design, to prototyping and digital fabrication including full-scale, thereby promoting a change of approach to design methods and production of architecture. It seems unmistakable that a different attitude towards the process is essential.

We also believe that the related theories have aspects that are complementary and may form an important basis for digital design. The concept of actors or actuators proposed by Latour is the basis for the design of multi-agent systems, which in turn also make use of strategies inspired from the swarm behavior.

Furthermore, we expect that digital games applied to design processes can explore aspects related to the change in attitude and propose environments that simulate various behaviors, encouraging collaborative strategies where the actuators can influence and be influenced by all participants of the game. These possibilities can give to design process more interactive features and clarify the goals to be achieved.

Finally, a question seems irreversible: the future of architecture will be collaborative, focused on enabling people to set up and improve the spaces in which they live themselves. Consequently, this future requires rethinking the role of architects and urban planners, and thus the very Architecture.

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