

Cell phones: a digital cartography of São Paulo¹

Telefones celulares: uma cartografia digital de São Paulo

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Abstract

The fundamental function of maps has always been to understand, interpret, and represent the world. Therefore, maps have a communication role, as a language. As communication tool, maps spatialize the interaction of social, economic and cultural urban realities in a graphic expression that provides the very meaning of urban systems. The aim of this paper is to report an academic study involving digital interface design graduate students. They investigated the role of locative media as potential instruments for registering and mapping experiences, observations and perceptions of urban life. This study considers that students can stimulate interactions across the city, whether, directly, in its physical space or, indirectly, through interfaces such as cell phone applications. The project also sought to discuss the cell phone as a producer of new languages, since instead of being merely a telephone it combines the functions of different media and can produce images, videos, sounds etc.

Keywords: Mobile phones. Locative media. Urban cartography. Urban interface. Semiotics.

Resumo

Desde as suas origens, os mapas foram feitos para definir um modo de compreensão, interpretação e representação do mundo, e deste modo, eles exercido continuamente o papel de atuar como linguagem e elemento de comunicação. Como ferramenta de comunicação, os mapas são capazes de espacializar a interação entre a realidade urbana social, econômica e cultural em uma expressão gráfica que fornece o significado do próprio sistema urbano. O objetivo deste trabalho é apresentar um projeto desenvolvido para o curso de graduação em design de interface digital que consistiu em reconhecer as mídias locativas como potencial instrumento para registro de experiências, observações e percepções da vida urbana, e do mapeamento destes registros, capazes de estimular o projeto na cidade, seja

¹ This project was developed as part of the courses "Theory of communication and perception" I and II, in the undergraduate design program, with a concentration in digital interface at Senac University Center, SP, between 2009 and 2011.



diretamente em seu espaço físico ou por meio de interfaces, como os próprios aplicativos para celulares. Além disto, objetivou-se também discutir o aparelho celular como produtor de novas linguagens, uma vez que mais que um telefone, o aparelho se tornou um agregado de mídias capazes de gerar imagens, vídeos, sons etc

Palavras-chave: Telefones celulares, mídia locativa, cartografia urbana, interface urbana, semiótica.

Introduction

The city concentrates all the metaphors of the digital age: network, interface, interaction, territory, representation and connection. Between city and experience, the technological interface represents an opportunity for learning about and producing real or potential spatial relations.

The city is porous, and concrete physical situations and digital networks penetrate each other, increasingly constituting manifestations of an extended reality, a hybrid environment where virtual and physical objects mix (MITCHELL, 2005). As Melvin Webber and the Archigram group have argued in the late 1960s, it is not possible to consider technology as a mere instrument or system dissociated from the context of contemporary cities.

The urban world has been increasingly filled in with data and information. The need for understanding where we are and how we displace to/from somewhere has been daily incorporated by mobile devices, as they become increasingly extensions of ourselves, of our cognitive ability to understand the world and to enable its mapping. At the same time, mobile devices as locative² media play a fundamental role by potentializing the generation and dissemination of information in city spaces and, consequently, the production of new cartographies as the user becomes a potential builder of urban (geo)localized databases.

According to Henri Lefebvre (1991), technology has defined and delimited the various stages of the city in its history, in terms of the physical dynamics of space, as well as in relation to its representation. Recently it has been even more intensified, once technology is able to act as mediation between citizens and the urban space.

All these statements are particularly relevant to the academic environment of design disciplines,

especially those dealing with urban interfaces and interaction design. The act of designing is materialized from reading and understanding the world through an attentive eye, motivated by a curious mind that is able to infer problems that reflect the dissatisfaction of designers regarding the incompleteness of the world around them. Thus, the idea of taking into account a more critical approach of these reflections is justified, once design aims to put forward new ways of improving the environment around us as a continuum process of its development. For this reason, it is necessary to discuss and to experience how to deal with these technologies that provide us new ways of exploring, observing and describing the urban environment around us and, at the same time, to understand how information and communication technologies and mobile devices can help us reorganize it.

This article is about the experimental project "Mobile Digital Cartographies". It was developed between 2009 and 2011 as part of the digital interface design course at Senac University Center in São Paulo. The main question addressed by the project was "how to provide new ways of understanding the urban environment in São Paulo by means of experiencing and registering its urban daily life through mobile phones, considered as locative multimedia tools, and transforming the collected data into different cartographies of the city", specially for those who will work as designers in this urban context. This question was formulated following what was pointed out by Emerson (2004, p. 11): "We organize information on maps in order to see our knowledge in a new way. As a result, maps suggest explanations; and while explanations reassure us, they also inspire us to ask more questions, consider other possibilities. To ask for a map is to say *Tell me a story*".

² According to Lemos (2007, p. 1), "locative is a grammatical category that expresses place, as 'in' or 'beside', indicating the final location or time of an action".

The idea of maps as “story-telling” artifacts allowed us to systemize the results of the proposed urban experience, which was based on a phenomenological approach to the city. This idea consists in seeing the urban life as a phenomenon. Following the ideas of Charles Sanders Peirce (1977), the phenomenological approach was conceived by three stages of faculty. The first faculty is that of seeing/observing. The second faculty is having the capacity of discriminating what is observed. The third faculty is the ability of generalizing the whole experience.

Thus, the project was supposed to achieve the following goals:

- to motivate observation, perception and creation of mappings urban experience by means of mobile and location-based technologies;
- to discover the city using reports based on personal experience as it is lived and perceived in daily life and to provide a counterpoint to and additional layer over other mass-media constructions that acting unveiling urban events in different situations. From the everyday life to the collective social movements;
- to understand mobile and locative technologies as an extension of the body and mind in daily activities, in view of its increasing and ever more effective role as mediator between information and action in urban space;
- to investigate the role of locative media as potential instruments for making records of urban life and mapping these records, which can stimulate projects in the city, whether directly in its physical space or indirectly through interfaces such as cell phone applications;
- to discuss the cell phone as a producer of new languages, since instead of being merely a telephone it combines the functions of different media and can produce images, videos, sounds etc.

As a methodological strategy, the project was divided in four stages based on regarding the city through a phenomenological approach: deconstructing, observing/perceiving, constructing and combining.

In the first we proposed to each student to deconstruct the city representation using semantic and visual maps, based on his/her concept of São Paulo

at that point. The initial hypothesis was that the knowledge about the city was contaminated by mass media content and language, which overlapped the concrete experience.

After that, they were invited to observe and register, with their mobile phones, their everyday life experience in São Paulo. All captured material had to be organized into files classified and spatialized on Google Maps website by date, place and concept. Then, the third stage consisted in organizing, selecting and processing their multimedia results into cartographies of São Paulo. The last stage was to confront the different maps, combining them into a panoramic view of different representations of the city using mobile and locative technologies.

Mobile digital cartographies

Initially, a discussion was held with those who took part in the Mobile Digital Cartographies project about what readings and perceptions they had of the city as well as what information they had about it. Based on collective discussions, a semantic map (Figure 1) of the city was created, in which a priori concepts and meanings were organized hierarchically according to how frequently and with what intensity they were mentioned by students.

Although to a large extent this semantic mapping reflected the common collective media imaginary about the city, it was essential as a point of reference in the deconstruction of the semantic model that had prevailed prior to the project and was subsequently reaffirmed when the participants created graphical metaphors using postcards that sought in some way to represent the city.

The aim of the second exercise was to create visual cards in an attempt, through pictorial abstraction, to establish an iconic dialog between the individual imaginary and the representation of the city. While in the first exercise the meaning attributed to words predominated, in the second the focus was on the iconic aspect of translating the city. The meaning was determined by the image. As a result, the conventions attributed to the city through words at times did not have a corresponding image and at other times had their meaning expanded or changed by the images attributed to them.

The result of these first approaches to São Paulo was a semantic (Figure 1) and visual panel (Figure 2) of the city in which the repetition of patterns and previously conceived concepts took precedence over real experience, clearly revealing the way in which the city is presented and treated by the different media, particularly the mass media. The media act as a filter in the construction of realities and, consequently, representations. This can be seen and confirmed in most of the participants' statements and productions up to that point in the project. The city was understood not so much in terms of actual experience as in terms of the virtuality of the city reported in the printed and electronic media. A contrasting view to this mass-media image was one of the points to be addressed in the project. The intention was to discover the city using reports based on personal experience as it is lived and perceived in daily life and to provide a counterpoint to and additional layer over other mass-media constructions.

These preliminary exercises were fundamental to reveal the existing understanding of the city and prepare students, as part of the project, to observe and perceive with a view to establishing the concept of urban environment that they each experienced

using cell phones by mapping the real, concrete day-to-day experience in urban space.

After the first stage was concluded, the students started to observe the city as it was reflected in their day-to-day lives and to capture it during their daily movements. They started to see the city as a new experience for those who observe it and respond almost instinctively to the stimulus it provides by capturing different moments, whether as images, sounds or videos. As Ferrara (1988, p. 1) states, "urban perception is essential for the city to be a source of new information: other habits, other way of living, other spatial quality. Inside the city homogeneity, habit is the sedimentation of an urban use and at the same time, the factor of low definition of the city as a source of information".

Informational urban spatiality

As the days went by, participants' reports tended less and less to reflect the widely accepted image of a generic city and increasingly to reflect a panorama contextualized in the space and time of the events captured by the cell phones. Motivated by a phenomenological approach in relation to the urban context



Figure 1 - Semantic Map

Source: Research data.

Note: The students listed the concepts attributed to the city as they understood it and recognized it. Depending on the frequency with which they were mentioned, concepts were given greater or lesser emphasis in the keyword cloud formed

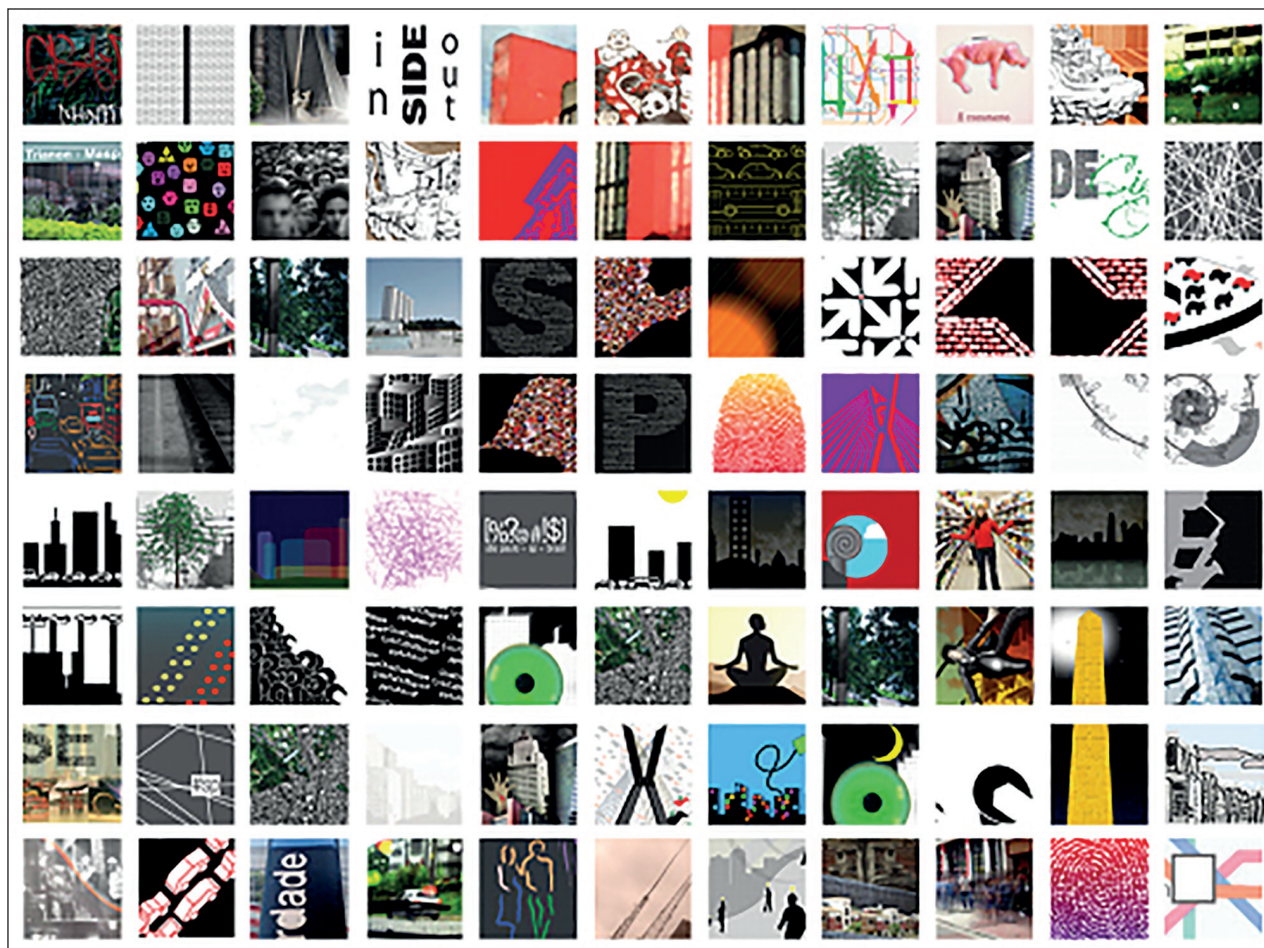


Figure 2 - Iconic Map

Source: Research data.

Note: Using shapes, colors and visual syntaxes, the students constructed postcards before they observed, perceived and generalized knowledge about the city using their cell phones. The collection of images revealed visual metaphors that expanded the semantic attributes of the previous mapping.

lived and perceived, students have acquired a more critical and lucid eye in relation to their own context and against the backdrop of the city, establishing cognitive tensions which were responsible for generating personal spatiality and composing new layers for informational semiotic reading of the city. According to Ferrara (2008, p. 15) “the potential unpredictability of spatiality determines its methodological strategy of understanding”. Thus, the exercise demanded a setting of design method of representation in which the tension was established between culture, communication, city and information. The purpose of using cell phone was not only to discuss its role as cultural extension and mediator of new habits and customs, but also to construct and reveal flows that reflected daily personal territories in the city. And it

is precisely in the established relationship between flows and fixed that builds the perception, sensation and representation of different urban spaces of the contemporary cities. It is important to mention that the articulation between city and urban space finds out in the technological means the new possibilities for dialogue and synergy.

Every day students’ routes and places that caught their attention were recorded and geolocated using tags in Google Earth and Google Maps (Figure 3) to build up a repository of data. This in turn was organized in digital directories, to which dates were assigned daily, and subdirectories, to which subjects were assigned by the participants according to the concepts, categories and meanings associated with the objects being documented. Once geolocated, these

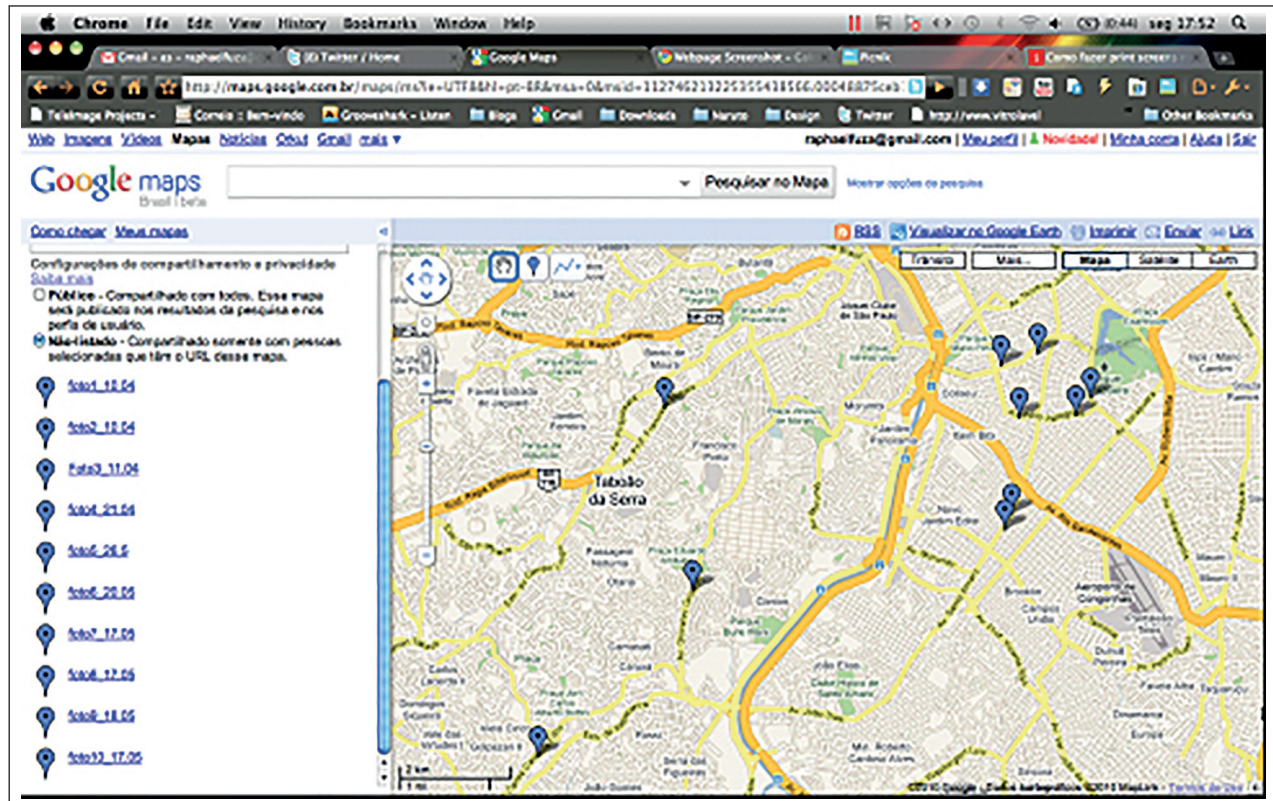


Figure 3 - Map of students' routes and records

Source: Research data.

Note: Every day students marked the place, time and reason for each record. The more they became used to observing the city, the more this exercise became an inherent part of their experience of the city. In this way, the cell phone became a fundamental item for the daily urban safari.

objects (images, sounds and videos) constituted the various cognitive layers of the city of São Paulo.

As Gordon and de Souza e Silva (2011, p. 21) point out:

[...] technological developments, particularly in the last century, have pushed mapping closer to the center of everyday life. And while there has always been a compulsion to organize information in terms of physical localities, it is only recently that this has manifested itself in such an obvious and dramatic way. Now that we are immersed in data, the map is the most logical framework through which to make sense of it.

The time when the records were processed also had to be noted and recorded as the factor "time" was a fundamental element in the process of understanding urban cycles and behaviors. It was found that rather than just defining discrete points, the

experience of the city shapes territories, which as parts come to represent the abstract concept of the city as a whole (Figure 4). When they come up against each other, territories intertwine both in shared narratives and in complementary temporal discoveries. An important point appreciated by all the participants was that space itself is constantly reconfigured during the time it is appropriated by the person or thing that signifies it.

[...] The analysis of spatiality, or of the manifestations of space in time and of the processed relationships among them, are supposed to realize not only that space and time are indissoluble, as Einstein stated, but especially to learn how time narrates the space, and how these narratives dialogue over the time of culture, establishing perceptual routines that constitute its semiotics and its brand. A dialogue between time and space is established, a dialogue that

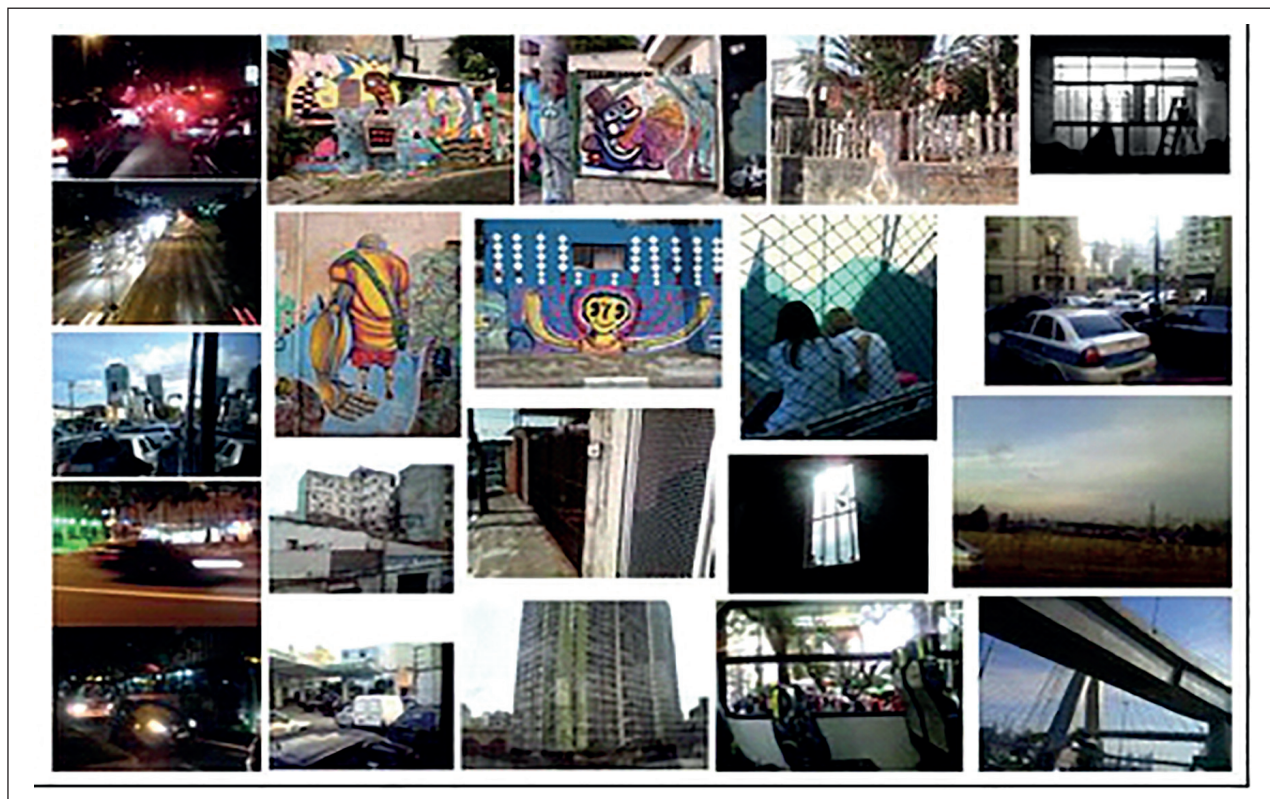


Figure 4 - Collected images

Source: Research data.

Note: Images collected by students during the first weeks of the stage of the project where they experienced the city using the cell phone as a recording and communication interface.

makes time to mirror on space and on it to build not only its signic materiality, but above all to realize the dominant cultural that arises as a result of changes that enrolled in the semiotic of the space, leading us to understand the manner and the rhythm of time transformations (FERRARA, 2008, p. 100).

Based on this quote, we argue that the manifestation of time in space generates endless spatialities, configured in a continuous semiosis, since new spatialities are created in every appropriation of the city. Thus, the possibility of registering the urban experience and, from this, to create digital cartographies allowed us to understand that urban space is built in a continuous transformative process, for it assumes infinite identities and meanings depending its different appropriations in time. This time parameter might be more instantaneous, when measured by minutes, hours, or more extended, when measured by weeks, months and years.

In this process of understanding urban space and time, other categories have emerged as integral elements of a verbal-visual grammar, where place, space and territory could be identified and recognized as a city repertoire and decoded in the visuality of the city. Among them, there are colors, textures, shapes, scales, lines, rhythm and many other visual potential qualities that can be related to urban landscape. Similarly, sounds were also observed and recorded as qualifiers of the city experience.

Sharing cartographies of urban experience

During this process participants also started to share their experiences spontaneously on their social networks (Figure 5) (Figure 6), reinforcing the understanding that their cell phones made them antennae and disseminators of content that could be shared once they were connected to the Internet. Linked to our body, the cell phone makes

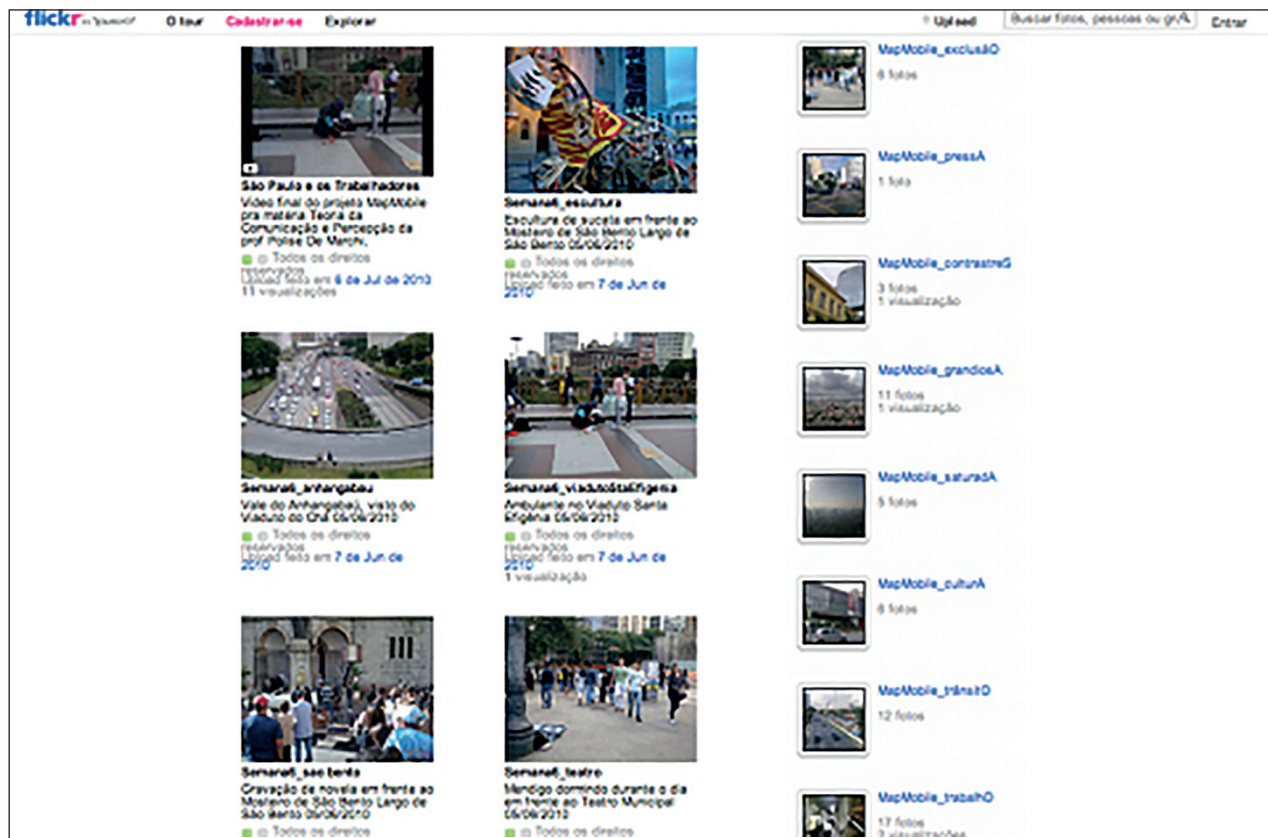


Figure 5 - Social Media

Source: Images posted on Flickr by Eduardo Ramos.

Available at: http://www.flickr.com/photos/nemphus/with/4770118610/#photo_4770118610

us an antenna in the midst of multiple connection possibilities.

This understanding was essential to allow students to appreciate the potential afforded by the ability to connect to something or somebody in different scales of space or time. When they appreciated that, once connected, their bodies became antennae; participants adopted a critical approach to their own acts in the midst of daily events that became transitory once filtered by information and communications technology-based media.

The exercise of observing and noticing the city of São Paulo in the midst of daily flows also led to discussion of the idea that the urban environment is a collection of layers of flows, whether physical or cognitive, cultural or financial, and that once integrated with them, we are also responsible for causing tensions within this information ecosystem with our own data when these are shared.

The capturing of visual fractions of the city, static images, moving images, sounds, real situations and

subjective impressions and the intersemiotic movements between city and memory recorded at a particular instant, led to new ways of perceiving São Paulo.

The use of the cell phone was not limited to recording but also reflected the fact that in addition to being a connective media when other devices are attached to it, it can be used to construct other ways of representing the urban world through a digital filter.

Digital cartographies

Accordingly, in this second stage, which lasted approximately two months, digital databases were built up based on participants' personal urban lives and experiences and were organized in subject categories according to the concepts produced by participants' personal ecosystems.

These new categories were then contrasted with the categories defined in the semantic panel in the first stage of the project. At this point participants

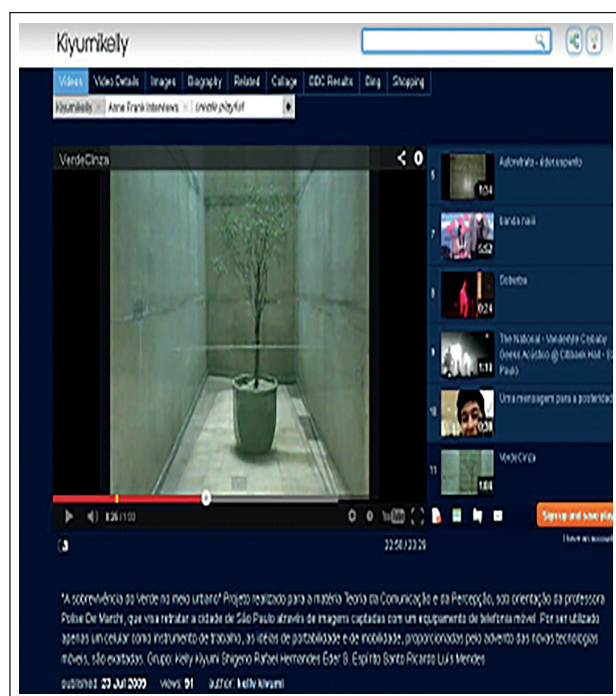


Figure 6 - Video "Gray Green"

Source: Video posted by Kelly Kiyumi on her personal site, by Kelly Kiyumi, Rafael Fernandes, Éder Espírito Santo and Ricardo Luis Mendes.

Available at: <http://wn.com/kiyumikelly>

started to perceive the city they lived in, as the exercise of observation based on records of their experiences was contrasted with observation based on the collective memory and imaginary defined before the experiment.

The focus of attention started to shift from previously recurrent categories such as traffic, pollution and violence, which reflect a negative attitude to the city and are constantly present in the media, to other less conventional categories such as silence, noise, beauty, lightness, fleetingness (Figure 7), color and green among many others, showing that once the cell phone is used as an extension of the body and mind, day-to-day events could be captured and processed. It is well known that the fact of being aware very often changes the way we perceive and move around a city, imposing other speeds and rhythms. However, in the present study, speed was incorporated as an element of experience and language in the images, noises and videos recorded when capturing urban moments on cell phones used as extensions of ourselves. Situations previously subjected to the daily dynamics of movement between

fixed points, once captured and stored, allow reality to be viewed and examined in a new way.

At this stage of the exercise, the project progressed from the experience of observing the city to that of perceiving it, where perception is assumed to be the result of a closer gaze that goes beyond observation and is constructed through a coming and going as we access our memory, which is built up from real and virtual experience. It is through the act of perceiving that we adopt a critical attitude toward what we understand and recognize as reality.

The phenomenic experience of urban observation and perception generated new urban syntaxes through their selection and organization, and geolocating personal routes on digital maps on the web. Moreover, these elements of urban visibility have also been translated into images, video narratives, sounds and textual descriptions of experienced sensations and emotions in daily trajectories. Through observation, aspects of the landscape were decoded by its visibility, and by understanding and conceptualizing this experience, visibilities were identified. As Ferrara (2002, p. 74) states:

In visibility, the looking and the visual do not subordinate or connect to each other, like occurs with visuality; on the contrary, the conceptual distance between them allows a better seeing. The way of looking of visibility is strategic and inquiring. It scans the visual to insert it, comparatively, in the plural experience of other individual and collective ways of looking: subjective and social, situated in time and space.

After several months using their cell phones as extensions of their minds and bodies, the participants were invited in the third stage of the project to process the material collected so as to construct their personal mobile media maps of the city.

This syntactic stage of the study, in which material was selected and organized, was preceded by discussions about, for example, the language of the new media: how does the representation of what we see, once filtered by electronic and digital appliances, incorporate the materialness and expressiveness of the media that produced it? And what is the difference between what I see and what I am trying to see?

This process led to greater recognition that cell phones and their mediatic resources have

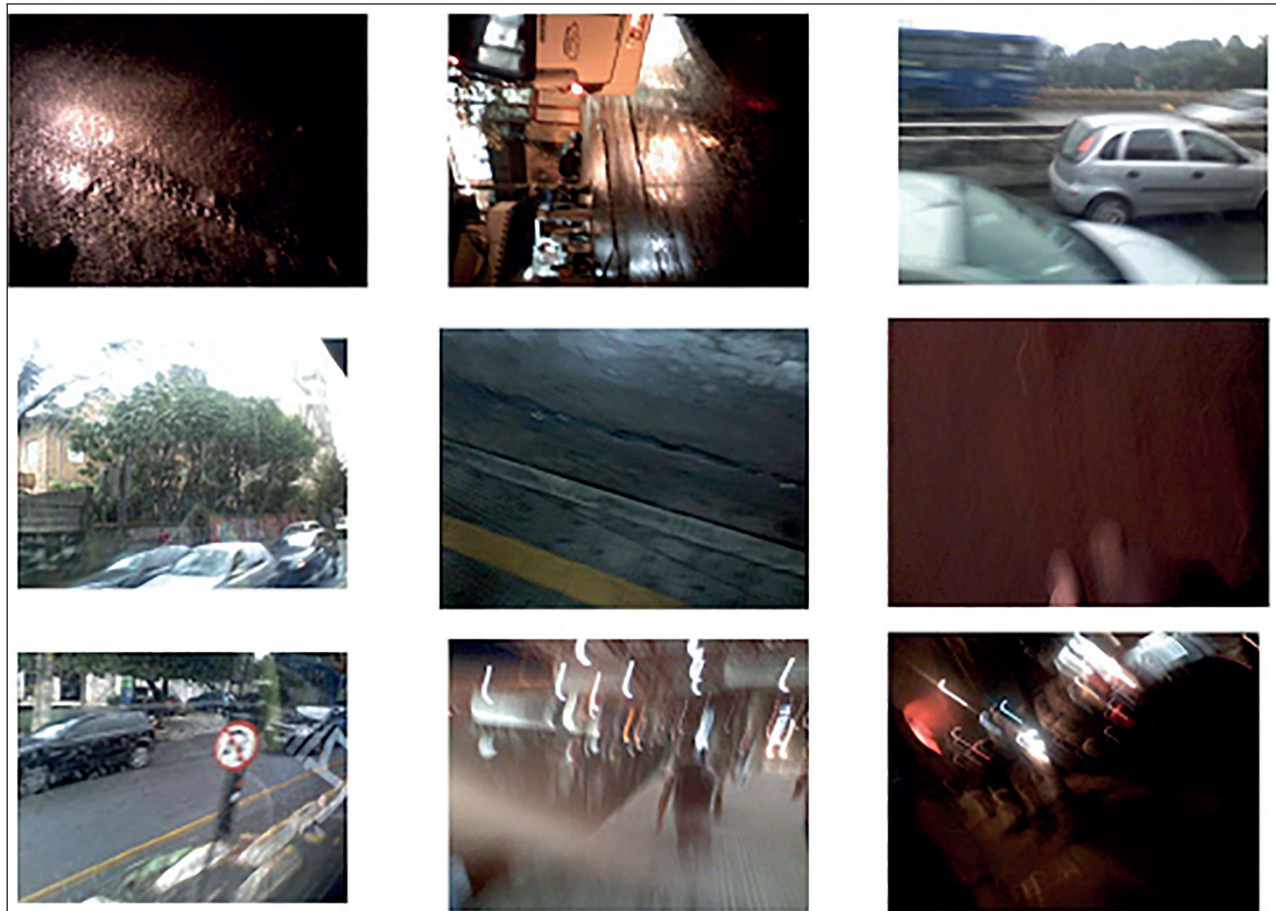


Figure 7 - Photographic records - "Fleetingness"

Source: Emanuela Almeida, 2010.

introduced new technological gazes, in the same way that earlier technological devices (such as cameras and sound recorders) helped to transform our perception of the world by acting as mediators of this construction. As Crang and Graham (2007, p. 808) argue, "Locative media offer a way then of making visible all these hidden stories of place."

Another fundamental aspect of the discussions that followed was that much of what was filtered with the aid of cell phones could be recognized in other parts of the urban world. Not only the space itself could be recognized but also the way it was documented, recorded and represented, as the same models of cell phones are distributed around the world and these same devices are connected to networks that keep users' files and records in a cloud so that there is global coverage of information, both in terms of inputs and outputs. "Urban ubiquitous computing systems entwine people,

place and software in complex ways. Software and algorithms code people, places and their data in interrelated systems that are then used to profile and drive decision-making systems" (CRANG; GRAHAM, 2007, p. 792).

Therefore, the dynamics of the way the city, or, more precisely, its urban environment, was represented meant that much of what could be observed locally could be reproduced on a global scale. In turn this reproduction potentially had an impact on the perception and recreation of new representations at a local level. The use of cell phones revealed a feedback process involving the imaginary of the contemporary urban world reproduced in a cloud.

The fact that data is stored using cloud-based architectures means that sharing is even more present, as although the data come from different places around the world, they can be stored in the same information spaces.

The discussions developed during this part of the project led to the third stage, which corresponded to the process of generalizing the knowledge produced by selecting images. These images were intended to represent the categories, or one overall category, that corresponded to the meaning of the city as defined by the students in the process of learning and relearning about São Paulo.

In addition to selecting the images, participants had to edit a video lasting up to one minute (Figure 8) that also synthesized the experience. Both the images and the videos embodied the concept of the city identified in the project and the way the city was represented using cell phones. Hence, the limitations imposed by the equipment, such as resolution, brightness and framing, as well as those associated with other technical resources, were also taken into

consideration when the languages produced were drawn up and acknowledged.

Once again, the importance attributed to the language constructed lies in the observation that language is representation and that representation is a construction of reality, i.e., representation is in itself reality (PEIRCE, 1977). Hence, the production and reproduction of mediatic products using cell phones constitute not only reproductions of reality but also as new configurational possibilities. This was one of the most extensively discussed aspects because, by considering cell phones as “extensions of ourselves”, they can be understood as shapers of reality; furthermore, because cell phones are connected to information and communication networks these realities can be shared and associated with other realities in different spaces and times.



Figure 8 - Video posted on YouTube - “Urban Solitude – You are (not) alone: Emptiness”

Source: Video by Luciano Andrade, Michel Malagueta and André Mozzaquatro.

Available at: <https://www.youtube.com/watch?v=xbVTyLb5tM>

In the fourth and last stage of the project, the participants presented their work and reorganized the information gathered since the beginning of the project using the images they had selected and the video summaries (Figure 9) to produce digital mobile cartographies that together represented an X-ray of the city at the time of the shared group experience. Because it combined different spaces and times, the final result corresponded to a never-ending mobile digital cartography made up of information layers that constantly absorbs new experiences and new records, redefining the very concept of cartography.

Rather than just track routes, the project sought to identify the possibilities and responsibilities for reconfiguring urban space with mobile technologies and the potential for exploring and constructing the urban environment using cell phones and their applications, whether they be related to the languages of representation, such as cameras, videos and editing programs, or to the optimization of time and urban functions and systems. Acknowledging mobile technologies as an integral part of contemporary urban culture involved using these technologies and investigating their impact on the way the city is understood and produced.

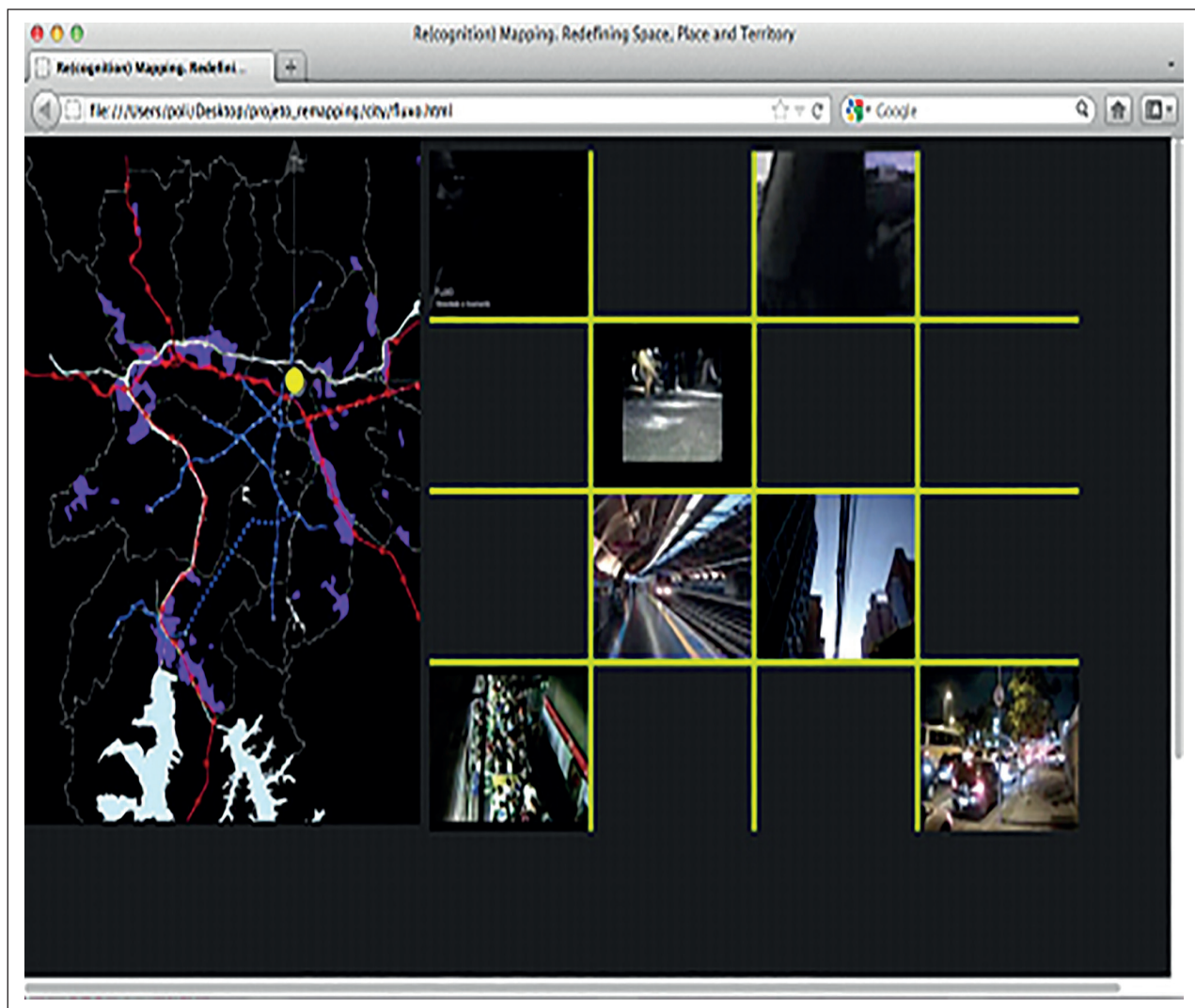


Figure 9 - Collective cartography of videos

Source: Research data.

Note: The videos were grouped by common keywords and could be accessed simultaneously, allowing viewers to appreciate that the city is made up of observations and perceptions resulting from different experiences of the city.

Conclusions

The result of this two-year project was an extensive mapping of the city in different cognitive layers and networks through the superimposition of space and time, image and text, and metaphor and metalanguage. Conscious use of the cell phones as an instrument for connecting with the world revealed its role as an agent that can incorporate mobility between space and time and between communication and production of information, in local and global urban spaces in contemporary cities, rather than merely be considered as a technological communications device. As Flusser (2007, p. 130) pointed out, humanity lives in a codified world where communication establishes the premises between understanding and representation of the phenomena, and because of that the human being “must mediate” (*vermitteln*), must give a ‘sense’ to the world. The new media, especially locative media, allows for a broad participation of everyone living and interacting in the city.

The research project aimed at discussing how to visualize spatial and personal relations, taking into account the increasing mobility and the saturation of electronic media that transform linear narratives in networked narratives (MOGEL, 2008), as well as at establishing a students’ proximity towards communication and production of contemporary city through the use of mobile technology, mainly with the use of images and videos. The maps that have been produced materialize the city through the diverse cognition of students. Thus, the ongoing project considered the very individual perception from the common citizen leveraged to a larger scale that ends up in a collaborative and inclusive map. It is a continuous and refreshing reinterpretation of physical cities and the meaning of urban life through digital media and interface design.

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Recebido: 02/09/2013

Received: 09/02/2013

Aprovado: 28/10/2013

Approved: 10/28/2013