A Kitchen, the Twitter and My Friends:
Having a Coffee with ICT

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ABSTRACT

As Information and Communication Technologies (ICTs) permeate people's interactions, designers face the challenge of creating new forms to promote contact among unrelated individuals and fostering the communication and potential support to leverage the sense of community in public spaces. This work is related to Urban Computing, studying the correlation among people, urban spaces and technologies. Our research is about observing and understanding the impact of ICT social support in a physical and social context. We developed an interactive application aiming at leveraging socialization in a public space inside a University Campus. Using an in-the-wild approach, our system brings some evidences showing to be efficient in supporting ways for people to socialize in situ and remotely.

Author Keywords
Urban computing; ICT interactive installation; third places; socialization; @CozinhaDC.

ACM Classification Keywords
H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

INTRODUCTION
Public places are places where people go in order to meet and interact with each other, such as pubs, bars, cafés and parks. Oldenburg [3] describes these environments as "third places" which are locations used for social and informal interaction outside home and work settings. Nevertheless, the number and the frequency of people in physical third places have been decreasing, mainly because the deterioration of the public spaces and the modern lifestyle, what can lead people to gradually embrace interactions via electronic media, online games and social networks [1, 2].

Over the last few years, the virtual social spaces and networks, such as Facebook and Twitter, have been through an impressive growth around the world [1].

Third places are places intended to allow people to enjoy each other's company promoting personal ties beyond home and workplace. They have a key role in community life, providing a democratic and affordable environment for the discussion of topics such as politics, sports, religion and cultural values. The neutrality of these places allows people to express themselves, strengthening the sense of belonging and the notion of community.

However, these places are disappearing, partly because of urbanization process and the modern lifestyle, leading people to have fewer opportunities to attend such places. This lack of third places and places to relieve the stressful demands of work and home life, affect individuals' quality of life in a community [3].

As much as virtual spaces tend to facilitate people's everyday lives, they also eliminate the need for them to be in the same place to be in contact, disrupting the traditional forms of communication and fostering the sense that technology isolates people from others. In contemporary society, third places are missing their value in the communities. Thus, individuals can suffer by the lack of places in the community to relieve the stressful demands of work and home life [12]. As a consequence, the culture of consumerism has increased, transforming leisure venues into private consumer goods [3]. This scenario is worsening relevant problems of contemporary cities, the absence of connection among people and fragmentation of communities [13].

Urban Computing is a research area to study the problems associated with designing technologies within the city, adding ubiquitous and pervasive technologies that can reshape the space and support community life [8]. It addresses a combination of sociality, mobility and proximity for people to develop awareness of their surroundings [4] as well as possibilities to interact with their peers. Ubiquitous and pervasive ICTs play an important role in the composition of these places, by constructing situations that disrupt the normal isolated posture in order to stimuli people to break the ice and interact with each other, promoting an active sense of inclusion across public social environments [5, 6].

We embrace the Urban Computing challenge to revitalize public spaces aiming to promote socialization in a "socially abandoned" place of a University Campus. This project focuses on the development of an interactive system called @CozinhaDC, a system designed for a common kitchen of a Department using ICT to support people to hangout with others in situ, to be invited when there are people around the kitchen, and to share their experience on social network.

ICT SUPPORTING SOCIALIZATION IN PUBLIC SPACES

Public spaces encompass our everyday social reality. In these spaces, the social experience happens influenced by our spatial behavior. This spatial behavior is defined by and defines the space around us [14]. With the omnipresence of ICTs in urban areas, a new layer (technologic) was added in the urban space, redefining people spatial behavior and raising a number of issues for interaction designers and urban architects. These issues refer to understand the impact of ICTs in urban areas and how to use them to transform the public space in a more attractive, social, safe and sustainable place.

Considering the problem of lack of interconnection among people of a community and the fragmentation of communities, ICTs can be used to address that [32]. However, the creation of ICT applications for public spaces should consider and promote the local culture and dynamism of cities, to best suit the needs and expectations of its users, facilitate their adoption and appropriation [15, 16, 17, 18]. In addition, designing ICT urban solutions need to consider issues such as the sustainability of technological investments, technical feasibility, efficiency and effectiveness [19].

Social interactions can be described as cyclical process of perception and reaction. In this process, individuals perceive and interpret the actions around them and respond with other actions in accordance with their objectives and expectations [20]. For the social experience to occur, individuals must be able to realize that people around them are open and accessible to socialize. This process is complex and can change depending on the moment, the emotional state, judgments, personal goals and experience [21].

According to Goffman [22], the success of social interactions depends on the individual's ability to observe and be aware that they are being observed. Furthermore, there is a dependence between the ability to understand intuitively an attempt to interact coming from another person with the competence to support this attempt.

Promoting social interactions in public spaces is a complex activity, once people need to engage in a conversation with a stranger [21]. In addition, there are some situations that occur in public spaces, such as when people avoid eye contact to not engage in a focused interaction with others [22]. Another example is when people engage socially in a collaborative process. Moreover, in public spaces interaction requires certain skills of people to transpire, identify and understand certain verbal, physical and even cultural information involving communication [23, 24, 31].

Paradoxically, the rise of ICTs into urban areas resulting in two major changes. ICTs have allowed the isolation within the crowd, intimacy and sense of closeness with people remotely, privacy in public spaces and lack of privacy in private spaces [25]. For example, people can use their personal mobile devices to remotely interact with friends and acquaintances, and to perform several activities simultaneously. Another change was the fact that digital media expand our physical presence to the virtual world. Thus, ICTs have enabled "private spaces" to become "public spaces" for socialization [21]. However, in the process of stimulation of social interaction in public areas, ICT can be part of the solution [26, 27]. Games such as MapAttack, Pac-Manhattan and Pokémon Go, use the sensors of personal mobile devices to stimulate exploration and interaction with the urban spaces, enhancing collaboration, meetings and social interactions, which can lead to a feeling of belonging and attachment to a place. MapAttack! (mapattack.org) is a strategy and collaborative game based on geolocation. Players must form teams and meet in a public space defined by the game to accumulate virtual points. Pac-Manahttan (pacmanhattan.com) is a remake of the Pac-Man game in real life that invites players to explore a region in Manhathan. Pokémon Go (pokemongo.com) is a geolocation and augmented reality based game that encourages people to explore their city to catch virtual monsters named as Pokémons. Players must go sightseeing in the city visiting spots, normally in parks and squares, to get items in order to play the game and train their Pokémons.

In this paper, our hypothesis is that promoting playfulness using ICT increases the socialization in the space and the sense of third place, called thirdplaceness [30], also expanding the social experience to the social networks.

FROM SPACES TO THIRD PLACES

Spaces and places are different. Since a place does not exist without a space (physical or virtual), what differentiates a place of a space are the psychological, social, cultural or historical ties people build on the environment [15]. Overall, for Cheng [21], factors that differentiate places from spaces are the existence of an identity, promotion of place attachment and social experience, celebration of local memory and they are uniqueness for their occupants.

Places are territories of meaning, spaces that you remember and care about [28]. This meaning can be referred to a place as a 'social space', since people perceived the environment through different senses and their perception are influenced by experiences, giving a significance to the spaces [29].

Focusing on the social dimension to give meaning and function to the space transforming spaces into qualitative places, leading to the phenomenon called thirdplaceness.

Thirdplaceness is a term used to indicate the event where and when a space, physical or virtual, has characteristics of a third place, leading people to feeling refers to the good memories, usually associated with the experiences in third places [30].

Promoting thirdplaceness can transform a space into a third place for a certain time or permanently. Aiming at providing this social context, we deployed an ICT installation called @CozinhaDC.

@COZINHADC

The @CozinhaDC is an integrated application designed to observe if there is an enrichment of social interactions and deployed at the kitchen of the Computing Department at the Federal University of Sao Carlos – UFSCar (see Figure 1). This place was chosen because students often use its coffee machine, but usually do not stay and enjoy this moment for conversations or other activities. Therefore, this location has a big potential to be a third place, because it has most of the features recommended by Oldenburg [3], such as being a free, low profile, neutral, highly accessible ground, having drinks and it provides a sense of equality. However, the space is not used for hanging out. Aiming to understand if ICT can support socialization leading to promote thirdplaceness [30], also using an extension to the virtual world, @CozinhaDC appears in this scenario seeking to provide some entertainment and cause the regulars to interact and expand such interaction to the virtual world. It combines activities from both virtual and physical spaces for allowing people to take photos and publish them on Twitter automatically.

@CozinhaDC is a persona that we created on Twitter to (i) invite people to go to the kitchen for a coffee, (ii) tell people who is at the kitchen, and (iii) tweet photos people took at the kitchen. Tweets based on time, kinect inputs and user events would define the messages:

Tweets based on time:

- Good morning DC! 8:00 AM ! (beginning of the work day)
- Break time Guys, What about a coffee to recharge batteries? 9:40 AM ! (at coffee break time)
- I am hungry! #missingSC 11:40 AM ! - (at lunch time - SC means StudentCafeteria)
- I believe so much in reincarnation, but I'm afraid to go back as the Student Cafeteria! #fear 10:30 AM ! (random comments and light jokes)
- All right, guys! I've talk a lot today. Sorry but I was excited with my first day! I will be quieter tomorrow! #ExcitingKitchen (message at the end of the work day)

Tweets based on kinect input:

- There are exciting people here! Have you made your photomontage using #CozinhaDC app? (Kinect detects more than one person)

- Somebody is alone having a coffee... This is not nice #comeonguys (Kinect detects one single person)
- I hope not be alone for too long:((Kinect doesn't detect anybody for X hours)

Tweets based on user input:

- Meanwhile at #CozinhaDC: (tweeted photomontage).

With that approach on Twitter, we were able to spread the invitation to go to the kitchen, showing what was happening in there and, also, letting people know that there was or there was not somebody hanging out in there. This approach aimed to observe if the presence of a physical space on an online social network can extend the space representation into the virtuality, along with the users involved with that place's community following the twitter profile, replying to its tweets, retweeting them, mentioning the profile and, also, liking its tweets.

**Figure 1. The kitchen of the Computing Department at UFSCar: without the system and with the system.**

The application is composed by a Microsoft Kinect sensor, a wearable device, a Twitter account and two different displays (see Figure 2). The basic functionality of the Kinect is to identify people that arrive in the kitchen, in order to start the interaction. Once the sensor perceives that any user reached the place, it causes the twitter to announce this fact, working as an invitation for others to go there. The twitter account is a personification of the kitchen, i.e., it is as if the kitchen could tweet something by itself. The purpose of doing that is to observe if the virtual world can have an impact on the socialization in the physical world and vice-versa.
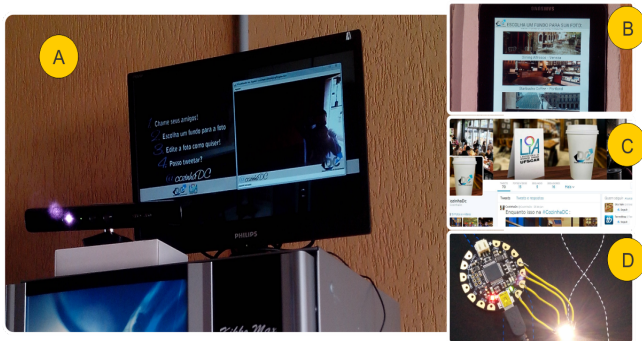
Figure 2. @CozinhaDC architecture: A) the Kinect and a big display; B) a tablet device; C) the @CozinhaDC Twitter page; D) a FLORA wearable electronic device.

Another part of the system is the wearable device, which consists of a small electronic platform that can be used under, with or on top of the bearer's clothes [9]. Its design must have to take some factors in consideration, such as their aesthetics, form and functionality [10]. Attempting to reach those goals, this first prototype incorporates a wearable device that controls a LED attached to it. This way, the presence of people in the kitchen also causes the light to turn on, having the same purpose of Twitter: tell people that someone is in the kitchen, then, they may feel invited to get along with him/her.

The tablet is used for allowing people to select different backgrounds for their photos, which may be the kitchen environment itself or any other place in the list. This list includes seven famous coffee shops around the world, such as Starbucks Coffee Portland, Le Cafe Marly (Paris) and Dining Alfresco (Venice). Once users had chosen the background of the photo, a ten seconds countdown starts on the big display, allowing them to prepare themselves for the shot (see figure 3). After the shot, the taken photo appears on the tablet and users can make a photomontage, tweet the result or simply discard it. If they choose to publish the photomontage, it is automatically posted on the @CozinhaDC Twitter page, finishing the interaction.
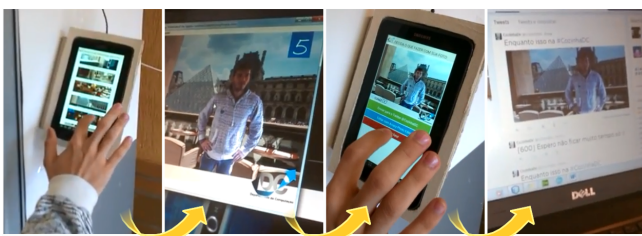

Figure 3. Overview of the system's event flow: using the tablet, the user chooses to take a photo; the photo taken is visualized on the screen above the coffee machine; the user then can edit the photo and share on Twitter; people then can see the photo on Twitter.

IN THE WILD STUDY

To measure and evaluate the results of @CozinhaDC's deployment we adopted an "in the wild" approach that has proven to be beneficial to conduct trials of ubiquitous computing [11]. This kind of study helps us to understand the participant responses and reflect on our own expectations, also creating connections and promoting empathy [7].

We put the system in the kitchen of the Computing Department at UFSCar for one week. We observed the users to understand how they perceived and approached the application. Besides, the system also registered their choices for further analysis, i.e., if they have chosen to take a photo, edit, discard or tweet the photo from the @CozinhaDC Twitter page (figure 5). Tweeted photomontages are shown in Figure 4.
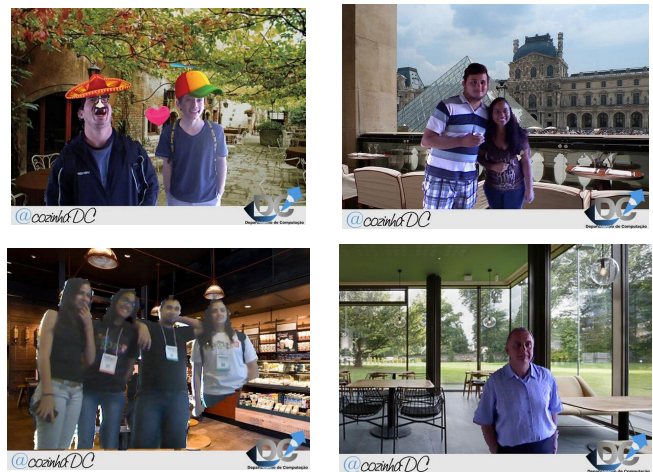
**Figure 4. Users' photomontage tweeted by @CozinhaDC.**

Figure 5. @CozinhaDC Twitter page.

As a complement, we also did a questionnaire aiming to collect their evaluation over the system and measure two main points: a) how attractive are the concept and the application itself; and b) what the regulars think about using technologies as facilitators for social interaction.

DATA ANALYSIS AND RESULTS

During this experiment, we had around 1400 visits of students, professors and visitors at the kitchen, whether it was motivated by the system or not. Over this short period, the application registered 52 photos taken by the users (Figure 6) and, in most of them, people were not alone but accompanied by a friend or "familiar strangers". 14 of the pictures taken were sent to Twitter. Also, 44% of the users have performed the image editing application to change the photo background, add stickers, text, etc. All of them have chosen another background image that was not the kitchen itself.
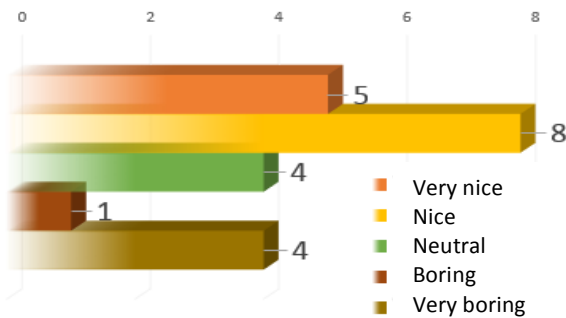
Figure 6. Users' opinions about the personification of the kitchen.

Additionally, 22 people answered our questionnaire. Most of them liked the idea of the kitchen "owning" a Twitter account (see figure 6) and the possibility of taking pictures in the department's kitchen (figure 7).
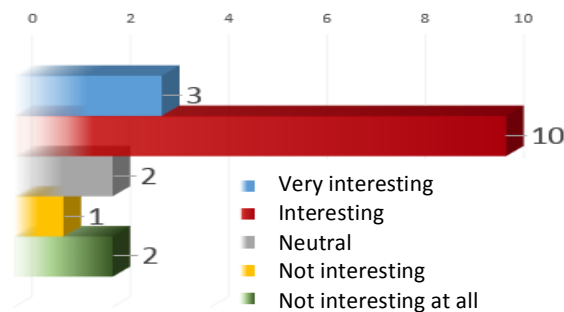

Figure 7. Users' views on the possibility of taking photos in the kitchen.

Figure 8 shows 35% of users accepted the ICT mediation to promote socialization at the department's kitchen (7 of 19), although around 18% observe that it does not help to interact with each other (4 of 19). 10% (2 of 19) felt uncomfortable with the installation.

During the week, @CozinhaDC had 85 tweets and 23 followers. With those results, we cannot state that the social

media approach impacts the social relationship happening in the physicality.
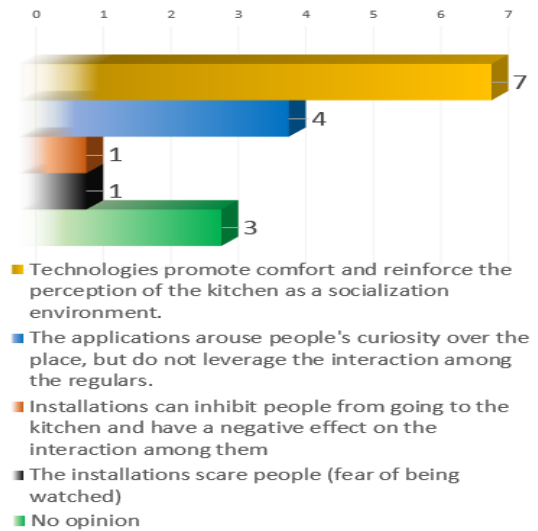
Figure 8. People's thoughts about the role of ICTs considering the place, the applications and their purpose.

CONCLUSIONS AND FUTURE WORK

We presented an interactive installation inside a University Campus to observe if technologies can leverage socialization and at some extent the sense of community of individuals in public spaces. Our hypothesis was that bringing playfulness using ICT, it can increase the socialization in the space and promote thirdplaceness, also expanding the social experience to the virtual social networks. With the results we showed that ICTs perform an important role in arousing people's curiosity, with some playful activity like photomontage, leading users to interact with others in situ. The application has provided ways for people to spark conversations. As reported by users, a sense of a third place was created, reinforcing the potential of such spaces in providing neutral ground for gathering and self-expression. However, we could not observe if expanding the social experience to the virtual social networks reinforces social interaction. There are still developments to explore in order to enhance the social environments and transforming them into interacting places. Also, more longitudinal studies are necessary to understand the correlation between social places and virtual social networks. As next steps, we want to provide elements that are more attractive to @CozinhaDC, in order to observe what is the users' behavior after overcoming the novelty factor. Then we can observe if there is continuity of the interactions among users supported by virtual social networks and the cultivation of an enhanced playful social setting.

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