Collective Choreography of Space: Modelling Digital Co-presence in a Public Arena

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Abstract

In this paper we report on recent investigations within an ongoing research project, which aims at developing a better understanding of the urban space augmented with the digital space. We are looking at developing sensing environments acting as an interface that can facilitate interactions between people and people, and people and their surrounding.

Here we describe a preliminary study that aims at mapping and visualising the digital presence of people in the public arena. We outline initial observatins about how people move and congregate, and illustrate the impact of the spatial and syntactical properties on the type of shared interactions. We suggest that by altering the relation between consciousness of communication and the intention of interaction, technology can be appropriated to support emergent choreography of space. This may help throw further light on the complex relationship between the digital space and urban space in general, and people's relationship to each other and to the sensing environment. Finally, we discuss our initial results and mention briefly our ongoing work.

Keywords:

Urban space, collective choreography, electro-magnetic field, digital presence.

Introduction

The public arena offers a "stage" for events and activities on which people negotiate boundaries of a social and cultural nature. It provides temporal and spatial mechanisms for generating and promoting various social interactions. With the advent of mobile pervasive technologies (always and everywhere present) and the rapid adoption of bluetooth-enabled[1] mobile devices, devices can emit a digital field that enables them to interact with nearby devices, and could create a digital stage for potential new interactions that could give different meanings to our activities. Whereas the social aspect is often taken into account in designing interactions enabled through digital technolgy, relatively little attention has been given to date, however, to the spatial properties and the individual aspects of the place, and so to address their impact on forming shared interactions, in particular within the urban context. We believe that the challenge is to develop strategies for articulating the new public arena that connect the urban space and the potential space created by the new media and technologies (Broekmann, 2004).

The body and its digital presence in the urban space

The potential impact of new technologies on shared interactions and their role in influencing social behaviour in the urban space is often accompanied by speculations.

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[1] A short-range electro-magnetic field that surrounds the mobile device forming a digital body.

In our previous work we have reported on different scenarios that explore digital interactions in the city, specifically, we noted the importance of two key human capacities: *consciousness* of communication and *intention* of interaction. At any given instant people can be conscious or unconscious of the communications taking place, and can carry out interactions intentionally or unintentionally (Fatah gen. Schieck and Kostakos, 2007). For instance, by using bluetooth-enabled devices, communication can be unconscious. A device will broadcast a digital field, as long as the bluetooth is switched on and set to discoverable. This digital field maps very closely to the movement of people as they carry their devices and move around the city. When a person accompanied by a device moves into the range of bluetooth sensors, his/her digital body could be sensed and information about his/her digital presence could be communicated. Data on patterns of the digital presence could be collected and visualised in real-time. Moreover, the properties of space, such a transient space (with high movement flow) or a persistent space (with more static activities) could be identified (O'Neill et al, 2006).

In the next sections we describe an approach for investigating the relation between new technologies, and active participation within the urban space. We briefly outline two scenarios. We then describe an early study, which was carried out to detect, and visualise the digital presence in the city, before finally discussing our results and on going work.

Setting the scene

"Architecture is no longer the play of masses in light. It now embraces the play of digital information in space" (Mitchell, 1999).

Scenario 1: The global space
Imagine big public projections in various locations in the city equipped with sensors that would sense and detect people's movement in the public space. The movement is reconstructed and projected as a visual representation; a composition of sound and light. Now imagine that everyone present in the public space carries a bluetooth-enabled device that transmits a kind of digital field around his/her body. People passing by would be detected while they are within the range of the sensors. Their digital presence would generate events that would affect the projected composition; creating a kind of real-time choreography and inviting them to embody different representational narratives, which generate an emergent collective experience that nonetheless allows distinct individual participation. As people move, they may come into contact with other people surrounded by a digital field. As a result the visual composition is constantly changing and evolving as it echoes the flux of movement throughout the city in real-time; a kind of collective choreography defined by the structure of space itself (Figure 3).

Scenario 2: The local space
Now imagine a composition, equipped with sensors that would react towards the body's digital presence in a specific location in the city. A liquid-like surface, is set into motion as the digital field, detected from nearby people comes into contact with the surface. The surface becomes like a "liquid" that is slowly sculpted into three-dimensional expressions and modulated by the movement of people present in the range of the sensors. As people congregate and socialise in the public arena, their digital presence is translated into complex visual forms presented by the rippling surface, which maintain perfect co-ordination with their presence and various aspects of synchronicity and duration (Figure 1).

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Figure 1 – People within the range of the sensors would be detected; their digital presence generates events that would set the surface into motion.

This is the concept; the introduction of technology would result in a fusion of sensory experiences and create a temporal sculpture: a construction of visuals, which evolves as a composition in time in an attempt to augment the existing interactions within the public space. In the next section we present an early stage of the concept implementation.

Method

A study was conducted recently in the city of Bath, UK. The aim was to map and visualize the physical, digital and social layers and to reconstruct a representation of patterns of movement and the digital co-presence in the urban space. Data about pedestrian movement were gathered using an observation-based survey in the study area. Both qualitative and quantitative analyses were performed. Nine different locations were selected to perform the observations. The selection of the locations was based on a previous study of the movement flow in Bath. The aim is to cover various types of spaces with low, medium and high pedestrian flow (O'Neill, E, et al, 2006). This study involved a pair of observers working together on each location. Data was recorded throughout 6 time sessions from 10:30-16:30 over the course of one day. One observer performed the manual pedestrian observation while the other performed the digital observation using a laptop with a bluetooth scanner. The observers recorded the movement flow and the digital presence at each location for 30 minutes.
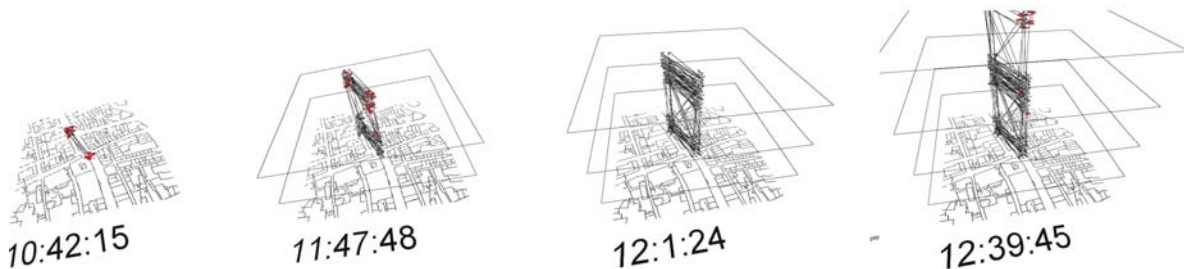

Figure 2 – A visualisation of the digital presence over time in two locations in Bath. Each plain represents one time session (30 min), the vertical connections indicate that a person remained in the same location for two time sessions, the horizontal connections indicate that a person moved between the two location in one time session, and the diagonal connections indicate that a person moved from one location to the other over the two time sessions (credit: MSc AAC students, 2006-7)
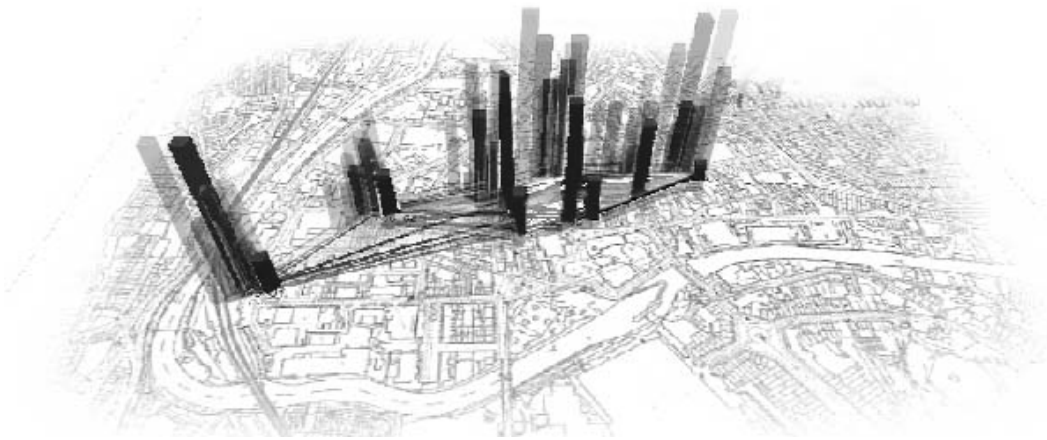
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Figure 3 – A visualisation of the digital presence over six time sessions in nine locations in Bath. Transparency indicates different time sessions. (A reconstruction based on MSc AAC students' work, 2006-7).

Discussion

The mapping and visualisation study of the relationship between the urban space, the movement flow and the digital presence proved to be successful, this proof of concept seemed quite important as it represents a step towards developing a better understanding of the urban space augmented with the digital space.

It seems that in order to achieve real integration on the urban level we need to bring together the urban space, the dynamic visual information and the interaction space. One way of achieving this could be by creating a kind of narrative integrating the various interactions into a meaningful whole. This may also promote a feeling of presence – of being there (Fatah gen. Schieck, 2006).

Our previous observations suggest that changing the communication from being unconscious into being conscious may provide a richer experience. For instance, presenting people with a visualisation of their unconscious-intentional (or unintentional) interactions with others makes people aware of theses interactions. This can possibly influence their behaviour or provide a motivation to change the way they communicate and engage in the public arena (Fatah gen. Schieck and Kostakos, 2007).

In the scenarios we presented we anticipate that the public projection may provide a stage for emergent social interactions among various people. Situating the projection in various locations, and depending on the context, might generate diverse and unpredicted interactions.

Laban has pointed out that space is the hidden principle of movement, and movement is a visible aspect of space (Laban, 1966). In the first scenario an emergent form would be created and generated in real-time by the people present in that public space. Their movement and presence in space would create a kind of a collective choreography that embraces people's presence, how they move and congregate in different places and this is mainly defined by the structure of the space itself.

We believe that creating a collective experience and providing the opportunity for people to participate actively would have a strong and inevitable social dimension and as such would influence the way in which involved parties interact. The experience might become a game that people enjoy and consequently it would increase their level of awareness and engagement in the public arena.

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Conclusions and ongoing work

We have presented an approach for exploring the relation between the urban space augmented with the digital space and the social interactions. We described two scenarios that explore potential roles of technology in supporting social interactions and presence within the public arena.

We reported on an early stage for the concept implementation based on a study carried out in the city of Bath. In our study an attempt was made to map and understand shared social and digital interactions, mediated by technology, and the spatial properties of the surroundings. We believe that the combination of consciousness of communication and intention of interaction becomes in particular interesting with the introduction of technology as an attempt to enhance, rather than replace, existing social interactions.

What happens when people are made aware of their digital presence and movement in the urban space? Would this encourage different type of interactions? How will this effect ofrre-inform people's perception of the space itself?

According to Laban, 1966, human beings first become conscious of their bodies through movement. Through motion, they become aware not only of their inner and outer space, but also determine the dimensions of the space surrounding them.

What about the city as a whole? Could digital technologies re-create a sense of collective place and a kind of belonging? Considerably more research is required in order to inform the understanding the relation between new pervasive technologies and the urban realm. As part of our ongoing work we are trying to address a number of issues that came up through our study. Specifically, we are exploring how digital interactions can alter the experience of the urban space, and whether the implementation of the concepts presented in this paper could change or affect the quality of various social interactions.

Acknowledgements

References

Broeckmann, A., 2004, Public Spheres and Network Interfaces, in: The Cybercities Reader, Routledge: London.

Fatah gen. Schieck, A., Kostakos, A., 2007, Exploring digital encounters in the city. In The 25th International Conference on Computer & Human Interactions CHI 2007, San Jose, USA.(position paper: Shared Encounters).

Fatah gen. Schieck, A., 2006, Towards an integrated architectural media space. First Monday, Special Issue #4. Urban Screens. www.firstmonday.org/issues/special11_2/fatah/index.html

Mitchell, W., 1999, E-topia: "urban life, Jim - but not as we know it", MIT Press.

Laban, R., 1966, Choreutics, Ullmann, L. (ed.). MacDonald and Evans, London.

Lozano-Hemmer, R., 2002, Alien Relationships with Public Space, in: TransUrbanism, NAI Publishers, Holland.

O'Neill, E., Kostakos, V., Kindberg, T., Fatah gen. Schieck, A., Penn, A., Stanton Fraser, D., and Jones, T., 2006, Instrumenting the city: developing methods for observing and understanding the digital cityscape. In proceedings UbiComp2006, Springer Berlin.