

An Architecturally Situated Approach to Place-based Mobile Interaction Design

Mikael Wiberg, PhD

Interaction Theory Lab, Department of Informatics, Umea University, Sweden
mwiberg@informatik.umu.se

Abstract. Today we can witness a trend within the area of CSCW towards design of smart environments, ubiquitous information landscapes, and location-based services. However, although all these efforts made concerns the blending of design of our physical surrounding with information technology and although we have learned from the field of environmental psychology that places shape human behavior there has so far been few attempts made to explore the role of physical places in the shaping of everyday social interaction for the purpose of identifying implications for mobile and ubiquitous interaction design. In this workshop paper we present the ArchITechtum project in which we have approached this issue by taking on an architecturally situated approach to inform interaction design “in the wild”. The paper presents our project and the method applied followed by some preliminary results and a discussion of its implications for mobile interaction design.

Introduction

Places, we live our lives in them and they constantly surround us. Places are as such a ubiquitous phenomenon in our everyday lives. Places are also essential to us as human beings in many ways. Amongst other things, our physical surrounding play an important role in the everyday shaping of human social behavior, and can, according to previous empirical studies made, support close collaboration, brief communication, everyday socialization, and social interaction (Jones, et al 2005, p.19). As further pointed out by e.g. Jones, et al (2005, p.19), research from *environmental psychology* (e.g. Bell et. al, 2001; Bechtel &

Churchman, 2002) and experience from the field of *architecture* show that places shape human behavior, and as such it opens up for several interesting questions from an interaction design perspective. According to Tietz (1998) architecture is something ubiquitous and a quite focal aspect of our everyday lives:

“The architecture that surround us defines a crucial part of our everyday lives. It shapes and defines the frames for our lives, the rooms in which we live, work, socialize, do our shopping, and spent our leisure time” (Tietz, 1998, p.6).

However, although there has been several voices raised for a closer relation between interaction design and architecture (see e.g. Streitz, et.al., 2002, p. 555; Jones, et al. 2005 and Sengers, et al 2004) there are still very little work that has explicitly set out to adapt an architecturally informed approach to the areas of mobile interaction design and ubiquitous computing. As formulated by Sengers, 2004:

“Imagine a world without architects, where only engineers construct buildings. With a keen eye towards functionality, these engineers would make sure buildings were sound, but something would be lacking. People would miss the richness of architecture – the designed connection to their lives, history, and culture. The designed experience of these buildings would be irrelevant to their social and personal concept of buildings. Yet this is the world researchers are inadvertently creating with ubiquitous computing” Sengers, et al (2004, p. 14).

This, despite the fact that several of the most recent attempts made in these areas of research focuses on design of various digital augmentation of our physical surrounding as to enable new novel place- and location-based services in support of social interaction “in the wild”.

In our ongoing research project called “ArchITechtum”, an acronym for Architecture, Information Technology and Social rooms, we are exploring the role of physical places in the shaping of everyday social interaction, and its implications for mobile interaction design. Methodologically, we are approaching this issue from an architecturally situated interaction design perspective as a way of gaining knowledge concerning the suitability of architecturally situated methods in interaction design projects.

Background

One of the most recurring topics throughout the years in the area of CSCW has been the discussion of the notion of place in relation to the concept of space. As argued by Harrison and Dourish (1996) it might be more appropriate and meaningful to talk about place instead of space for several reasons:

“We will argue that the critical property which designers are seeking, which we call appropriate behavioral framing, is not rooted in the properties of space at all. Instead, it is rooted in sets of mutually-held, and mutually available, cultural understandings about behaviour and action. In contrast to “space”, we call this a sense of “place”. Our principle is: “Space is the opportunity; place is the understood reality”. Place is a fundamental concept in architecture and urban design, and we can learn from those disciplines how to think about

place in collaborative systems. Place derives from a tension between connectedness and distinction, rather than from three-dimensional structure, and we can see this at work in a variety of collaborative systems.” (Harrison & Dourish, 1996).

In our research project we would like to revisit this discussion and reintroduce the notion and importance of physical places for the purpose of gaining new important knowledge regarding place-based interaction design beyond the simple view of places as solely locations, while at the same time avoiding to make it a solely social question by just talking about social spaces. Our aim is thus to follow the recommendation made by Harrison and Dourish (1996) and explore an architecturally informed approach to place-based mobile interaction design.

So far, the most recent attempts made in the two research areas of mobile interaction design and ubiquitous computing when it comes to place-based design of interactive systems has recently been summarized and analyzed according to the P3-framework (i.e. the “Person-to-Person-to-Geographical-Places”-framework) (Jones & Grandhi, 2004; Jones et al, 2004; Jones et al, 2005). In their research Jones, et al. (2005) points out the importance to further explore the notion of place and develop our knowledge concerning the role of the physical surrounding in the shaping of human social activities. Similar arguments in support of more architecturally informed interaction design projects capable of linking together technical, social and cultural aspects of digitally enhanced environments has also most recently been highlighted by Sengers, et al (2004).

The ArchITechtum project

In our ongoing research project called “ArchITechtum” we are exploring the role of physical places in the shaping of everyday social interaction and its implications for mobile interaction design. More specifically we have been interested in identifying specific qualities in the physical context that supports and scaffolds social interaction, and which might be possible to generalize into design requirements, implications and inspirational sources for design of information technology in support of everyday human social processes.

In order to approach this core issue we have conducted a pre-study aimed at gaining knowledge about how architects reason and think about design of physical places in support of social structures, social processes and social interaction. Our study included a series of qualitative interviews in which we have asked three different kinds of architects questions related to design of physical places in support of social interaction. The three different groups of architects included: 1) the local city architect responsible for the overall physical and geographical layout of the city, including roads, buildings, parks, etc. 2) the municipal architect responsible for planning of local neighborhoods and 3) architects at Arkinova Arkitekter AB, a Swedish architecture firm working with both interior and exterior design.

In this conducted study we were interested in gaining knowledge about different ways in which physical or geographical places can be designed to support social interaction, and then, based on the outcome from this pre-study, identify some implications for design of ubiquitous computing environments in support of everyday social interaction.

Research approach – Architecturally situated interaction design

As previously mentioned, and as pointed out by Jones, et al (2005, p.19), research from *environmental psychology* (e.g. Bell et. Al, 2001; Bechtel & Churchman, 2002) and experience from the field of *architecture* show that places shape human behavior, and as such it opens up for several interesting questions from an interaction design perspective. Following this suggestion, our project is guided by the “*architecturally situated interaction design approach*” as suggested by McCullough (2004):

“This foundation [architecturally situated interaction design] incorporates the ideas of philosophers on embodiment, psychologists on persistent structures, architects on scale and type, engineers on embedded systems, cultural geographers on infrastructures, and environmental economists on the value of places“ McCullough (2004, p. xiv).

In terms of embodiment we aim at design and implementation of novel mobile services and devices in support of the mobility of its users, and in terms of persistent structures we are interested in the ongoing and dynamic character of everyday social interaction. Further on, we aim at emulating the architectural dimensions identified (e.g. scale and type) in the design of the mobile device and the focus on embedded systems is covered in our interest in ubiquitous computing, and more specifically by bringing in competence from the field of applied physics and engineering for the implementation of the hardware for the mobile devices. Concerning infrastructures we are interested in both technical and social infrastructures (rituals, norms, procedures, etc) and how people make social use of geographical physical places, this through both interviews with architects as well as through observational studies of real world places. Finally, the value of physical places is highly acknowledged in our project through our focus on place-based design of mobile computing instead of following the more commonly applied “anytime, anywhere” vision of future wireless applications. Following this research outline, our overall research agenda include:

- *An empirical study* of architects and their thinking around design of physical environments in support of social activities
- *Observational contextual studies* of real world geographical places and its shaping and scaffolding of human social interaction
- *Literature studies* into the area of environmental psychology for the purpose to identifying implications for social interaction design.
- *Knowledge transfer activities* – in order to explore implications from the area of environmental psychology for interaction design

- *Prototyping* aimed at emulating the socially influential character of geographical places on small mobile devices
- *Design and implementation work* to enable real world testing and validation of proof-of-concept prototypes.
- *Ethnographical techniques* to observe the developed prototypes in real use settings.

The overall approach taken in this project can be described as an architecturally situated approach to place-based design of ubiquitous computing in support of everyday social interaction, followed by a traditional process including design and evaluation of working prototype systems. Following this method, this project will result in both a practical illustration of a place-based design of mobile devices as well as it will hopefully result in more general implications for current place-based interaction theories, and some methodological implications for guiding design of ubiquitous computing environments.

To methodologically approach the first question raised in this project, i.e. question of how to design place-based interactive systems based on an understanding of how geographical places shape human social behavior, we have conducted a qualitative empirical study aimed at gaining knowledge about how architects think about design of physical places in support of social structures, social processes and social interaction. The purpose of this pre-study presented in this paper is thus to, guided by knowledge from the world of architecture, find new ways to think about how to design *user interplaces* that supports social interaction composed of various kinds of ubiquitous computing systems. The basic idea here is thus to explore if we can design (ubiquitous) technology so pervasive that it disappears into the surrounding of the user, as formulated by Weiser (1991), but still also support something very focal to us as human beings, i.e. the maintenance of our social structures, social processes, social rituals, and our social, face-to-face and everyday interactions.

We started out by conducting a series of qualitative interviews in which we asked three different kinds of architects questions related to design of physical places in support of social interaction. The three different groups of architects included: 1) the local city architect responsible for the overall physical and geographical layout of the city, including roads, buildings, parks, etc. 2) the municipal architect responsible for planning of local neighborhoods and 3) architects at Arkinova Arkitekter AB, a Swedish architecture firm working with both interior and exterior design.

In this pre-study we were interested in gaining knowledge on different ways in which physical or geographical places can be designed to support social interaction, and then, based on the outcome from this pre-study, identify some implications for design of ubiquitous computing environments in support of everyday social interaction.

Based on the results from our interviews and our observational data the biggest challenge was to move from these observations to design. This challenge to bridge the gap between empirical research and design has been reported elsewhere (e.g. in the work done by Shapiro, Roundsfield, etc) and in this project we tackled it as follows. Basically, our attempt was to *emulate* the social shaping character of places in the design of a novel mobile device in support of keeping social structures going and our basic underlying argumentation for doing this can be summarized as follows. Our point of departure in this study was the well-documented fact that the physical layout of geographical places shape social behavior. Thus, our aim was to start out in identifying some different ways in which this happens. Having been able to do that we then wanted to extract the essence of the social shaping character of places, understand these “hidden” social structuring cues (hidden, but very familiar to us!) and then leverage these hidden cues in the design of a novel mobile device. Having arrived at such an alternative place-based design we then wanted to apply standard HCI evaluation techniques to validate our approach taken in this project and our developed prototype system.

In the next section we present the results from the interview study together with our collected observational data from real world geographical places.

Preliminary results

Currently we are working on extracting some important aspects of how geographical places can shape human social behavior. So far, our preliminary analysis of the empirical data collected during this project tells us that physical and geographical places can: 1) *frame* social interaction, 2) *trigger* social interaction (e.g. some extra space in the middle of a corridor might serve as a ground for the establishment of spontaneous conversations between people passing each other in a hallway), and finally 3) *accentuate* social interaction (e.g. a club locale can, in a very unobtrusive and ambient way scaffold the social relations that already exists within a group of people). Below we will illustrate these findings to some extent.

Indeed, and as previous research in the area of environmental psychology has shown, places can serve a lot of different everyday purposes, and a lot of different social needs (Bell et. Al, 2001; Bechtel & Churchman, 2002). E.g. a room can be used as a dining room, and then later in the night serve as a living room, or even a dance floor. This concerns our *interpretations* of a room and these interpretations might help us to understand different social contexts. But our surrounding also guide our human actions in more direct ways in which we might not start out by first interpreting our surrounding, followed by actions taken to adjust ourselves according to what we think is the most appropriate behavior in a specific setting. Instead, some environmental elements can affect our social behaviors without our

conscious thinking about it. This unconscious and direct influence on our human social behavior was the primary focus for our empirical pre-study, motivated by the recent trends towards pervasive and ubiquitous computing for which one overall objective is to design for invisibility, design for subtle input and system output, and reflect a computing paradigm devoted to the non-obvious aspects of human interaction, e.g. all of our five different senses, our peripheral field of vision, etc. and how it can be used in interaction design (e.g. tactile feedback, graspable UIs, sonic information cues, gesture interaction, embodied interaction, peripheral/ambient displays, etc.).

Below, these three different ways in which the physical surrounding can, unconsciously but at the same time very direct, affect our social behavior will be presented in some more detail. Overall, we found from our empirical pre-study that places communicates some implicit or “hidden” cues in the following ways:

1) Places support *framing* of social interaction

According to the architects interviewed, geographical places fill an important role in the *framing* of social interaction. Places like cafés, bars, lunchrooms, meeting rooms, etc. are geographical areas that bring people together for various social reasons and for various social activities. Typically, these areas or places have spatial boundaries like walls and doors, which define the “inside” of the place, and which help to separate it from the “outside”, i.e. other nearby locations.

Another way in which places can help in the framing of social interaction is related to the arrangement of different *furniture*. In e.g. café environments small tables with chairs around each table help in guiding people to form small “social islands” that support private conversations, and help in establishing small private spheres in an in other aspects ordinary open public place. In figure 1 this kind of physical arrangement of tables and chairs is illustrated.



Fig 1. Furniture arranged to frame social interaction into small informal social interaction islands in an open public place.

As illustrated in figure 1, it is not only the walls surrounding a location that defines a place, neither its geographical location, but also the arrangement of tables and chairs to form “social islands” affects the ways in which people interact. What can be immediately observed here is that this setting, with this particular configuration of furniture, is not primarily arranged for big general meetings (although it can easily be rearranged to support this by for instance putting away the tables and lining up all chairs in rows) but are more appropriate for small scale, informal, social interaction.

The idea that a geographical location can help in bringing people closer together and support social framing is an observation quite similar to the arguments made by Castells (2002) in his description of “spatially bounded communities” in which people get together socially because they live next to each other geographically speaking. Further on, Castells points out that social communities are hard to understand if not studied as something apart from something else. This observation confirms the arguments made above concerning the role of physical barriers (e.g. walls or fences) to frame social interaction in terms of keeping people on the inside vs. keeping people on the outside.

This way of designing for inclusion and making a clear distinction between “being on the inside” vs. “being on the outside” is something that can easily be observed outside *social framing* places like bars, nightclubs, etc. Figure 2 illustrates one such social setting in which physical barriers have been mounted on the ground as to make people stand and wait in a line (which is in itself by the way a certain kind of social formation) outside the place in focus. In this kind of settings a big point is made out of having people waiting on the outside, kept isolated from the people on the inside. From this picture below it is quite clear how the physical arrangement of the place also shapes the ways in which people come together and interact in this place. Almost anyone understands this setting as a “waiting-in-line-to-get-inside”-setting. So, in this example made the arrangement of the physical surrounding not only frames social interaction on a general level but this setting is also very much about structuring social interaction in a very direct sense.

It should be noted here that this direct approach to use the physical surrounding as to structure social activities is not something exceptional for bars and nightclubs. On the contrary, these kinds of arrangements are typical at e.g. airports, amusement parks, theatres, and museums and in other places where it is important to keep people in certain formations.



Fig 2. Physical arrangement in support of social queuing in front of the Corona nightclub.

As mentioned above, in this kind of social settings a big point is made out of maintaining this tension between “the inside” vs. “the outside”. It is important for these places that it should remain to be important to be let inside. To address this concern guards are sometimes hired as gatekeepers to keep this distinction clear. In these settings it is a big difference between being on the outside vs. being on the inside although the difference in location might just be a couple of meters. Just to be on the inside might give a sense of belonging to a social community. Further on, keeping people waiting on the outside fills another important purpose, i.e. the important purpose of showing other people passing by that this particular place is worth waiting for and as such a really interesting place to be at.

2) Places can *accentuate* social interaction

Another theme that was possible to extract from our interviews, and then followed up in our observational study of real world settings, was how geographical places can *accentuate* social interaction.

Here we view accentuation of social interaction as something that augments, pinpoints or underlines everyday social interaction among people who know each other quite well. An accentuation is something that does not interrupt the ongoing relation these persons have, but it rather just amplifies the interaction that is already there. An accentuation of social interaction is something that the participants are aware of, or can become aware of, but it happens in the background, i.e. it is part of the environment. Since an accentuation of social interaction does not interrupt, but rather amplifies social interaction it can be viewed as something that can take interaction that is already ongoing to another level. It is something that makes people feel a sense of social belonging or something that scaffolds the social interaction among people.

An accentuation of social interaction can also be of various intensity. It can be to collectively nod ones heads to show a person who is giving a speech that they all agree upon what he or she is saying, or it can be physical arrangements in the environment that scaffold or accentuate social interaction.

Sounds can also be used to accentuate social interaction. This use of sounds to accentuate social interaction are quite common in TV shows like e.g. the well-known “Late show with David Letterman” in which Paul Shaffer, i.e. David Letterman’s conductor, accentuate things said by David Letterman by making the orchestra in the studio play a few tones or just beat shortly on the studio drum set.



Figure 3. A picture of David Letterman and his accentuating companion Paul Shaffer.

As outlined above, geographical places can also accentuate social interaction. According to the architects interviewed, typical settings in support of accentuation of social interaction are stages, rock concerts and clubhouses. As for the case with clubhouses, these places can support this kind of accentuation of social interaction through various decorations of these places including signs, symbols and artifacts that communicates what kind of interests the people share that frequently visit a particular place.

Further on, and as mentioned above, stages and rock concerts are good examples of places that accentuate social interaction. Figure 4 illustrates one such public “stage” around a fountain (left) and a picture from a rock concert (right). In these two pictures it is easy to see how such a place attracts people to come together. As such, these places supports social gatherings and play an important role in accentuating these persons feeling of social belonging (either between persons with tight relationships as members of the same club, or more loosely coupled groups like people that shares the same kind of taste in music).



Figure 4. Two typical “social gathering” places in support of accentuation of social interaction.

Similarly, a university campus (which is also commonly organized on a quite limited geographical area) serves this purpose of accentuating social interaction and plays an important role in the creation of a social belonging atmosphere. It helps in the creation of a “we”-feeling like “we are students at this campus” compared to “I study at this university”.

Although this accentuation aspect of places does not always lead to any form of direct or active interaction (like two persons that are having a conversation) it serves a purpose of supporting a kind of background social awareness or group presence.

3) Places can be designed to *trigger* social interaction

As presented above, places can accentuate social interaction and as such serve as important background scaffolding of already ongoing interaction. But places can also be designed as to support more direct establishment of social interaction between persons. Places can in fact, according to the architects interviewed, be designed to *trigger* social interaction, i.e. to go from a passive or latent mode of interaction to a more direct and active mode.

During our pre-study we found that a place can be designed to serve as a *trigger* of social interaction, or the other way around, i.e. a place can be designed for non-interaction. These two different designs are illustrated in figure 5.



Fig 5. Two classical “corridor” designs.

The left-most picture in figure 5 shows an ordinary walkway in the middle of a city. The sides of the sidewalk are marked out with dark stones as a contrast to the light-gray stones that covers the whole market area. The sidewalk is designed as a very straight line across the town and the sidewalk is quite wide to make it easy for people to pass without bumping into one another. This design supports the fluidity of people wandering around in the city and it is designed to support this wandering for very many persons. The basis idea here is to enable people to as easy as possible get themselves from point A to point B.

Office buildings from to 70’s are typically built according to the same basic principle (see the right-most picture in figure 5). The corridors in these buildings

are typically designed as straight “tunnels” with doors leading to offices and meeting rooms on both sides of the corridor. The basic idea behind this design was the same as with the walkway design, i.e. to primarily support easy *transportation* of people between different places.

Today, the underlying idea of modern corridor design is somewhat different. Although the focus on transportation of people between different places still exists it has now been complemented with a focus on supporting unplanned spontaneous social interaction. Because of this, the modern corridor is now designed with small extra spaces (see “A” in figure 6), which makes it possible for people to step aside and have a short spontaneous meeting if they happen to bump into each other in the corridor. It is also commonly designed in different forms than just a straight line in order to slow people down and make it more likely that people might stop for brief conversations (see “B” in figure 6). These design principles does not only apply to modern corridor design. It has also been applied to design of e.g. bicycle bridges. Figure 6 illustrates the idea of extra spaces for spontaneous meetings in the middle of the bicycle bridge (see mark “C”) together with a new curved form of the bridge (see mark “D”) rather than a straight line design. With this curved design it is not so easy to see if there is someone coming towards you which makes it important to keep ones eyes open for anybody that might appear just in front of you.



Figure 6. Two different examples of design in support of initiation of spontaneous social interaction.

As these examples have illustrated places can be designed to not only frame and accentuate social interaction, but also to *trigger* social interaction.

Emulating these three characters in the design of SocioTags

With these preliminary findings as a point of departure we have in our project explored different ways of emulating this place-based social scaffolding characters (i.e. the framing, triggering, and accentuation of social interaction) in the design of a novel mobile device in support of keeping our social structures going. Methodologically, this emulation is done through explorations of abstract representations of these characteristics and its implications for design rather than striving for a realistic or mimetic re-representation of these characters in the design.

For the moment we are working on emulating the *framing*, *triggering* and *accentuating* character of physical places in the design of a social mobile scaffolding device called SocioTags. In our work on deriving design implications from our initial empirical findings for the design of SocioTags we have focused on designing a small, wearable “social belonging technology” (to meet the social *framing* character of places) aimed at *trigger* spontaneous conversations between people passing by each other in typical office floor hallways. However, we also want the design to be as unobtrusive and ambient as the *accentuating* character of places. Thus, our proposed system will try to trigger social interaction through very subtle sonic cues.

On a very overall level, the SocioTags are designed as 12 small mobile devices that communicate in an ad-hoc fashion with other nearby SocioTags (within just 3 feet). Whenever another SocioTag is within this very limited range, i.e. when two persons are passing each other in a hallway, the two SocioTags makes a very subtle noise. Figure 7 illustrates the design of the SocioTags.



Figure 7. Three pictures of the SocioTags.

We have during the spring conducted a small study of the SocioTags in use and our very preliminary results tells us that these small noises made by the SocioTags can actually trigger some face-to-face interaction between the persons

wearing these devices. Further on, in follow-up interviews the test persons have reported that the SocioTags creates a sense of social belonging with other persons wearing a SocioTag.

Related systems and prototypes

While mobile phones and SMS provide good support for social networking over various geographical distances there has also been some very interesting work done on mobile IT-support for co-located social interaction. Here, the pioneering work on the design of the MemeTags (Borovoy, et. al., 1998) and the iBalls (Borovoy, et. al., 2001) systems are worth mentioning as two early prototype systems designed to support co-located social interaction. Following this trend to support co-located social interaction with mobile devices there has been several interesting projects conducted that have inspired us in the design of the SocioTags. In table 1 we will therefore present this quite extensive body of related work while we at the same time wants to point out how our work differs from these previous attempts made. As illustrated in table 1 there have been several systems developed that deals with IT-support for mobile social interaction in one way or another. However, while there are several similarities between the systems (i.e. mobile devices in support of social interaction) there are also several things about these systems that make them quite different. In table 1 we have illustrated their main differences by categorizing the systems according to the axis of proximity range and kind of social relation, i.e. if it support persons who already know each other or if it support stranger interaction.

Social relation Proximity range	Known persons /Friends	Unknown persons /Strangers
"close-up"/intimate distance	"Close-up interaction" RoamWare HocMan SocioTags <div style="text-align: right; border: 1px solid black; width: 20px; height: 20px; margin-left: auto;">1</div>	"Social icebreaker" MemeTags iBalls iBand <div style="text-align: right; border: 1px solid black; width: 20px; height: 20px; margin-left: auto;">2</div>
"nearby"	"Awareness support" ActiveBadges Hummingbird ProxyLady FriendFinder <div style="text-align: right; border: 1px solid black; width: 20px; height: 20px; margin-left: auto;">3</div>	"Stranger interaction" JabberWockey Lovegietties FolkMusic MobiTip <div style="text-align: right; border: 1px solid black; width: 20px; height: 20px; margin-left: auto;">4</div>

Table 1. 2*2 matrix illustrating related systems and prototypes

As illustrated in table 1 the SocioTags are designed to trigger co-located interaction among persons who already know each other. Being a mobile device

in support of close co-located social interaction among persons who already know each other makes it similar to the RoamWare system (Wiberg, 2001), a mobile system designed to automatically, and in the background of its users attention, generate dynamic contact lists during spontaneous face-to-face meetings, or the HocMan system (Esbjörnsson, et. al., 2004), i.e. a mobile system that enable bikers to automatically exchange homepages when passing each other on the highway. However, the SocioTags differs from these previous systems in that it is intended to trigger face-to-face interaction whenever two persons are passing by each other instead of function as a bridge to later interaction.

There has also been a couple of mobile systems designed to function as “social icebreakers” between persons who do not know each other, e.g. the MemeTags system (Borovoy, et. al., 1998), iBalls (Borovoy, et. al., 2001) and the iBand system (Kanis, et. al., 2005) (see square 2 in table 1).

Further on, there has also been some interesting and related work done on design of mobile awareness devices in support of persons who already know each other (e.g. the ActiveBadge system (Want, et. al., 1992), Hummingbird (Holmqvist, et. al., 1999) and ProxyLady (Dahlberg, et. al., 2000). Here, these systems are designed to cover greater distances (around 100-400 meters around its user) thus being a support for being aware of who is around rather than being a support for close-up interaction (one exception is the ProxyLady system that also has some functions in support of co-located interaction including e.g. a dynamic ToDo-list). Here there has also been several commercial mobile “friendfinder” services developed that covers even greater geographic distances that enables its user to see if any friends (who has this service activated) are in the same geographic area, e.g. at campus or in the city.

Finally, there have been some recent systems developed to support “stranger interaction” (Paulos & Goodman, 2004). These systems include e.g. the JabberWockey system (Paulos & Goodman, 2004), the commercial dating devices called “LoveGetties”, the FolkMusic system (Wiberg, 2004) that enables strangers to share their MP3 playlists in MANETs (Mobile Ad-hoc Networks) and also listen to music shared by other strangers and finally, the MobiTip system (Rudström, et. al., 2005) that enable strangers to share tips and opinions among other co-located peers including e.g. restaurant tips, etc.

As illustrated in table 1 the SocioTags are quite different from these previous systems developed since it is a mobile device not designed to support co-located interaction in terms of being a mediator for in-place interaction, rather it is designed to mainly function as a subtle trigger for close-up face-to-face interaction.

Conclusions

In this paper we have proposed the architecturally situated interaction design approach as a way of addressing the workshop theme of how to capture and understand how places shape behavior and its implications for interaction design. We have also presented some preliminary findings and results from our ongoing project aimed at designing place-based mobile services.

We believe that the field of architecture has important lessons to teach us, and we think that a blending of the area of mobile and ubiquitous computing with the area of architecture is important in order to make good progress in design of smart environments, location-based services and ubiquitous information landscapes. Further on, we see this as a way of refueling and renewing the classic place vs. space discussion within CSCW.

On an overall level we think that our ongoing work can contribute to the development of methods for interaction design “in the wild” through the architecturally situated approach as applied in our project. Further on, we think that our work can contribute to current research on design of place-based services through our efforts on design and implementation of novel place-based mobile social scaffolding devices.

References

- Bechtel, R & Churchman, (2002) Handbook of Environmental Psychology, Cloth. Wiley, New York, USA.
- Bell, P. (2001) Environmental Psychology, Thomson Learning, Texas, USA
- Borovoy, et al, (1998). Meme tags and community mirrors: moving from conferences to collaboration; Proceedings of the ACM 1998 conference on Computer supported cooperative work, 1998, Page 159.
- Borovoy, R., Silverman, B., Gorton, T., Notowidigdo, M., Knep, B., Resnick, M., Jeff Klann, J. (2001) Folk computing: revisiting oral tradition as a scaffold for co-present communities, Proceedings of the SIGCHI conference on Human factors in computing systems.
- Castells, M. (2002) Internetgalaxen, Bokförlaget Daidalos, Sverige.
- Dahlberg, P., F. Ljungberg, and J. Sanneblad (2000). Supporting Opportunistic Communication in Mobile Settings. In Proceedings of CHI'2000, ACM Press.
- Esbjörnsson, M., Juhlin, O., Östergren, M. (2004) Traffic encounters and Hocman: associating motorcycle ethnography with design, Personal and Ubiquitous Computing, Vol 8 Issue 2.
- Harrison, S., and Dourish, P. (1996) Re-place-ing space: the roles of place and space in collaborative systems, Proceedings of the 1996 ACM conference on CSCW.
- Holmquist, L.E., Falk J. and Wigström, J. (1999). Supporting Group Collaboration with Inter-Personal Awareness Devices. Journal of Personal Technologies, 3(1-2), Springer.
- Jones, Q., and Grandhi S.A., (2004) Supporting Proximate Communities with P3-Systems: Technology for Connecting People-To-People-To-Geographical-Places. In: The Interaction Society, M. Wiberg (Ed.), Idea Group, Inc. New York.

- Jones, Q., Grandhi, S., Terveen, L., Whittaker, S., and Chivakula, K. (2004). Putting Systems into Place: A Qualitative Study of Design Requirements for Location-Aware Community Systems. Proc. of Conference on Computer Supported Cooperative Work. New York: ACM Press.
- Jones, Q., Grandhi, S., Terveen, L., Whittaker, S. (2005). People-To-People-to-Geographical Places: The P3 Framework for Location-Based Community Systems, Computer Supported Cooperative Work, 13, 249-282.
- Kanis, M., Winters, N., Agamanolis, S., Gavin, A., and Cullinan, C. (2005) Toward Wearable Social Networking with iBand (poster), presented at CHI 2005 Conference on Human Factors in Computing Systems, Portland, Oregon, 2 - 7 April 2005, ACM Press.
- McCullough, M. (2004) Digital Ground: Architecture, Pervasive Computing, and Environmental Knowing, Cloth. MIT Press, UK.
- Paulos, E., Goodman, E. (2004) The familiar stranger: anxiety, comfort, and play in public places, Proceedings of the SIGCHI conference on Human factors in computing systems.
- Rudström, Å., Höök K., and Svensson, M. (2005) Social positioning: Designing the Seams between Social, Physical and Digital Space. In Proceedings of HCI2005.
- Sengers, P., et al (2004) Culturally Embedded Computing, Pervasive Computing, Vol 3, No 1.
- Streitz, et.al., (2002) Roomware: Toward the next generation of human-computer interaction based on an integrated design of real and virtual worlds, In: Human Computer Interaction in the next millennium, Carroll, J. (Ed), Addison-Wesley, ACM Press.
- Tietz, J. (1998) Geschichte der Architektur des 20. Jahrhunderts, Könemann Verlagsgesellschaft mbH.
- Want, R., Hopper, A., Falcão, V., and Gibbons, J., (Jan. 1992), The active badge location system; ACM Trans. Inf. Syst. 10, 1 Pages 91 -102.
- Wiberg M (2001) RoamWare: An integrated architecture for seamless interaction in between mobile meetings. Proceedings of the 2001 International ACM SIGGROUP Conference o Supporting Group Work. ACM Press, Boulder, Colorado, pp 288-297.
- Wiberg, M. (2004) FolkMusic: A mobile peer-to-peer entertainment system, In proceedings of the Thirty-Seventh Annual Hawaii International Conference on System Sciences, HICSS37. Hawaii, USA.