STAGING URBAN ATMOSPHERES IN INTERACTION DESIGN

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In this paper, we address the concept of atmosphere from a designerly perspective and discuss challenges facing interaction designers who seek to stage atmospheres in urban settings. We outline previous academic works on atmosphere and the emergence of atmosphere as a subject-space encounter, primarily on the basis on Gernot Böhme's notion of atmosphere. We then present the argument that, in the field of interaction design, it is worthwhile to expand an analytical and operational understanding of atmosphere to encompass technological, social and temporal concerns, as these are central to interaction design discourse. In order to explore this expanded notion of atmosphere in practice, we present and discuss two cases of urban interaction design in which we have employed various interactive means of staging and evoking atmospheres.

INTRODUCTION

Within theory of architecture, product design, theatre and performance art, a long tradition of working with atmospheres exists as a means of engaging the sensing subject in its physico-spatial surroundings. The notion of atmosphere is part of our everyday parlance; however, it is also an intangible and ambiguous aesthetic concept. It can be used to denote a mood created by a group of people or a place, e.g. "the atmosphere of the restaurant was relaxed and friendly" or "an atmosphere of tension filled the room as she walked in". It can also refer to a philosophical approach to the development and evaluation of architecture. Within the field of interaction design, atmosphere is, however, a mostly neglected dimension. This is quite paradoxical, given the increasing interest within the field in physico-spatial and social aspects of interactive systems. In 1996, Harrison and Dourish (1996) introduced a distinction between the notions of "place" and "space" which has influenced many subsequent discussions within interaction design. Whereas "space" denoted the three-dimensional structure of the world in which objects and events occur, "place" would be the user's experienced and meaningful reality – a space embedded with values. This notion of place encompasses temporal, social and technological concerns which are only vaguely outlined, if at all, in traditional studies and articulations of atmosphere. These concerns are, however, of crucial interest to interaction designers. In short, the field of interaction design lacks a structured overview of means and effects to employ when staging atmospheres related to interactive systems, services and artifacts. Our primary concern in this paper is therefore to bring attention to the promising, yet largely unexplored concept of

atmospheres in interaction design, to articulate salient elements that constitute the concept, and to explore the staging of atmospheres in two specific interactive installations. Since our work has primarily been carried out in urban settings, we shall draw upon examples from this domain.

The paper is outlined as follows: First we introduce traditional work on atmospheres in urban settings, primarily on the basis of Gernot Böhme's notion of atmosphere. We then discuss the expanding foci of interest within the field of Human-Computer Interaction (HCI). Based on this, we put forward an analytical model of atmosphere in interaction design that builds upon Böhme's approach and furthermore encompasses the subject-space relation influenced by technological and social aspects. We then analyse two projects based on this model, and discuss how and why technological and social aspects are substantial to interaction designers addressing the notion of atmosphere. The model has been developed on the basis of reflections upon existing projects, rather than serving as a resource for design; however, a logical next step would be to investigate how the model could serve to inform future design projects. We conclude by outlining thoughts on the model and its potentials and limitations for the practice and analysis of interaction design.

TRADITIONAL WORK ON THE NOTION OF ATMOSPHERE

The relation between the embodied subject and the perceptible surrounding space has been explored thoroughly by the German philosopher and scientist, Gernot Böhme. The concept of atmosphere was introduced by Böhme in 1995 (1995), as the basic concept for a new aesthetics without a point of departure in art. He defines atmospheres as "spheres of presence". Atmosphere is the manner in which we experience a space. They are not bound to a place but nonetheless poured out into, thus shaping, the space. Böhme neither locates them in the objects that exude them, nor in the subjects, who physically sense them, but in between them and in both of them at the same time. They constitute the spectators' first sensation on entering the space and enable a very specific experience of spatiality. It cannot be explained by reference to individual objects because atmospheres exist in the interplay of elements. The atmospheres are "… spaces insofar as they are tinged by the presence of things, people, or the surrounding constellations (Böhme 1995:33). To Böhme not only the secondary qualities of an object are thought of as ecstasies (colour, odour,

sound), but also primary qualities such as its form, volume and scale.

As such, the atmospheres are created by things, people and their surroundings. They are not objective, like certain properties that things have, and yet they are tangible, belonging to that thing insofar as these things articulate the spheres of their presence through their properties – thought of as ecstasies. Neither are atmospheres something subjective, such as a mental state of mind. And yet, they are of the subject, form a part of it, insofar as they are sensed by people physically present cf. (Böhme, 1995:33).
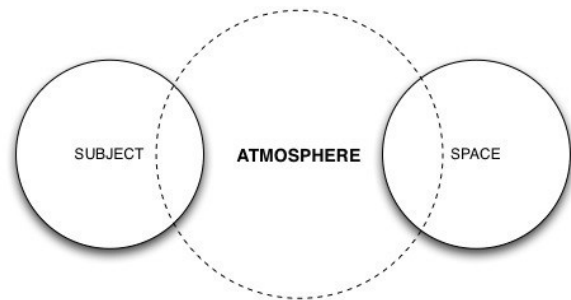

Figure 1: Illustration of Böhme's understanding of atmosphere as a concept both lying at the intersection between subject and space, however, also in the subject and in the space at the same time.

In a theatre the spectators sense the presence of the actors' characters though a creation of an atmospheric effect, namely the potential of the impressions which are experienced atmospherically (Böhme, 1995:124, 135). Usually, a combination of all of our senses is utilised when sensing atmospheres. The spectators are not positioned opposite to or outside the atmosphere; they are enclosed by and steeped in it.

Martin Seel (Seel 2004) proposes the notion of "atmospheric appearing" as one of three dimensions of appearance. According to Seel, atmosphere is "a sensuously and affectionally perceptible (…) articulation of realised and nonrealised life possibilities" (Seel 2004). Atmospheres are also given even if no one is paying attention to them. We are surrounded by the atmosphere of a room and sense it even if we do not know anything about it (Seel 2004:92).

Turning to the concept of "space" Böhme outlines the concept as follows: The European tradition of thinking the concept of "space" is usually thought of in two mathematical ways: One, which stems from the Aristotelian understanding of the space as topos, a place constituted by the relations of positions which cannot be measured; and another, which understands space as a spatium with distances and intervals that can be measured as in the tradition of Descartes. These two distinctions have a profound comparability with the before mentioned notions of "place" and "space", respectively, by Harrison

and Dourish (1996). However, according to Böhme a third understanding of space is needed in order to investigate atmospheres, and that is the space of bodily presence (Böhme 2007: 31). The space of bodily presence is the phenomenological experience of being physically situated in the world. Our experience of the world is always grounded in our bodily being in it (Merleau-Ponty 1945). In order to work with atmospheres we have to see ourselves as sensing bodies and not just as subjects gifted with consciousness and self-consciousness. We have to regard the things that surround us not as single objects, but as constellations of objects that impose a certain atmosphere onto our minds, an atmosphere more powerful than the specific aesthetics of an object.

Atmospheric architecture

The concept of atmosphere is highly relevant in the present day, not least for the reason that the emerging experience economy (Pine and Gilmore 1999) has induced an increased focus on how to design the user experience and accordingly which means to utilise in order to stage these experiences. However, staging the users' experiences of urban spaces and architecture is not a new phenomenon. In ancient Greece the construction of amphitheatres such as e.g. Epidauros (ca. 350 BC) included thorough investigation of the optimal user experience. The exceptional acoustics permitted almost perfect intelligibility of unamplified spoken word from the proscenium to all 15.000 spectators, regardless of their seating. As regarding the visuals, a view to the landscape behind the scene was an integral part of the setting creating a piece of scenery for the stories.

In the Middle Ages the construction of gothic cathedrals was executed based on an ideology of achieving a physical representation of the Heavenly Jerusalem. The verticality of the architecture striving towards the sky was made possible by ribbed vaults, pointed arches, and flying buttresses enabling light to pervade the construction of the buildings. The windows were often filled with stained glass (e.g. La Sainte-Chapelle in Paris, 1248) which added a dimension of colour to the light within the building and to an atmosphere of sublimity and geometrical perfection (Simson 1997, Böhme 2006).

A contemporary example of staging the user experience in urban spaces is the Thermal Baths in Vals, Switzerland (1996) by the Swiss architect, Peter Zumthor. Here, Zumthor takes the conceptual starting point in the geology of Vals. He works with the light, texture and structure of the mountains and utilises the elements within the ritual of the bath, such as water, steam and heat to create an archaic atmosphere of relaxation and sensuous

impressions[1]. To Zumthor form is less important. What is important is the light, the feeling, the atmosphere and the bodily presence in an evocative space: "In order to design buildings with a sensuous connection to life, one must think in a way that goes far beyond form and construction" (Zumthor 1998).

Increasingly, the cityscape has come to influence atmosphere studies. In continuation of Böhme's phenomenological perspective, the sociologist Niels Albertsen stresses that atmosphere is not just about the sensual experience of a space - mobility is crucial for the atmosphere of the modern city (Albertsen 1999). He sees the atmosphere of mobility as the atmosphere of plunging – that is the rapidly plunges from one atmospheric setting to another. However, in this perspective atmospheres are still constituted of a relation between the moving subject and its environmental space.

As this very rough overview of atmosphere studies outlines, the focus of traditional atmosphere studies has been on atmosphere as an emergent quality in the encounter between subject and space. Many of these studies have highlighted sensuous, bodily presence in physico-spatial surroundings as their main interest. The temporal dimension of atmosphere has primarily been treated implicitly, in that human experience of the atmosphere of a place must necessarily emerge in time. Likewise, only cursory interest has been afforded the social dimension, as atmospheres are also tinged by the presence of people, cf. (Böhme 1995:33). The technological dimension plays a more prominent certain, as is evident e.g. in the lighting design of Zumthor's thermal baths which serves to stage certain atmospheres.

AN EXPANDED MODEL OF ATMOSPHERE

When turning to the field of HCI we lack dimensions that go beyond Böhmes subject-space relation, and it is not sufficient to define atmosphere as multi-sensorial experiences and qualities inherent in a mediated environmental setting. The subject's relation to atmospheric interaction spaces also encompasses a situated action and experience in social and technological relations. We argue for an expansion of the subject-space-(time) relation into an understanding of atmosphere that encompasses the dimensions of subject, space, technology and others. The arguments for this expansion reside on both a practical and a theoretical level, as we will explore in the following sections.

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[1]   http://www.galinsky.com/buildings/baths/,http://www-rcf.usc.edu/~kcoleman/Precedents/ALL%20PDFs/Zumthor_ThermalBaths.pdf

Practical concerns

On a practical level, our aim is to explore atmosphere as it relates to interaction design in urban contexts. Interaction design, and HCI in particular, has from the off-set had as its locus of interest the subject-technology relation, namely *interaction*.

Figure 2: Interaction as subject-technology relation in traditional HCI.

A crucial property of interactive systems is that they are in essence temporal and processual; although the rules governing a system may be formalised and static. It is through the execution of these rules in time that the interactive character and properties of the systems appear for subjects to experience. The temporal dimension is thus implicit in the interaction process. Since its inception, the scope of interaction design has expanded in (at least) two important respects:
First, it has expanded to encompass *social relations*. This is evident in the two cases elaborated on in this paper, in which the presence of other agents and the social relations that unfold between the subject and others are salient phenomena to take into account on a practical level;
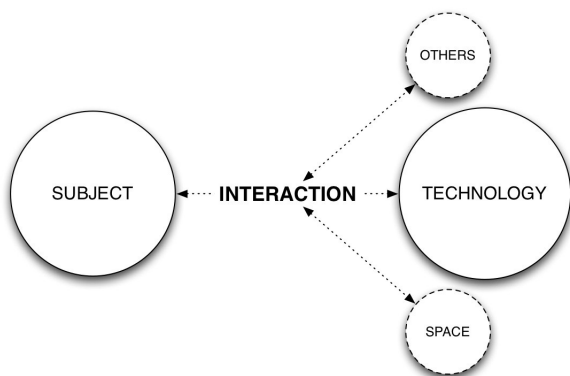

Figure 3: Space and others are of increasing interest for HCI researchers.

Second, it increasingly incorporates *physico-spatial concerns*, also of great importance to practitioners in the urban design domain.
The key focus for interaction designers is, however, still the interaction process, and the interest in social and physico-spatial aspects are primarily of interest to the extent that they influence interaction, as illustrated in Figure 3.

Theoretical concerns

On a theoretical level, we further argue that an understanding of atmosphere as it relates to urban interaction design also has to take into account the dimensions of *others*, and *technology*.
Given the proposition that atmosphere emerges, as stated by e.g. Böhme, in the encounter between subject and space, the subject's experience is a main constituting factor in understanding atmosphere. Taking our off-set in pragmatist philosophy, we argue that experience of atmosphere encompasses a temporal dimension: we carry with us preconceptualisations and a repertoire of knowledge from past experience, as well as expectations and anticipations of what we are about to experience, into our encounter with atmosphere in space. Furthermore, our experience of atmosphere unfolds in a temporal progression in the course of the encounter; atmosphere can thus be construed as a processual phenomenon rather than a static one, implying that the dimension of *time* is essential to understanding atmosphere. Since that our experience of the present is based on prior experience and coloured by our intentions with regards to future events, it is always in some respect directed towards practice and potential action in unfolding relations. This may be the case in relation to *space* (sensual relations), as stated by Böhme, but also in relation to *others* (i.e. social relations) and to *technology* (i.e. interaction relations).
As for social relations, urban atmospheres are co-constituted by the presence or potential presence of *others*. At times, we are acutely aware of others in our vicinity; this awareness may in fact be a major part of the atmosphere of a place. We are seldom alone in the urban setting, but even when we are, there is always the possibility of the presence of others. Scholars within social studies (e.g. Goffman 1956) as well as theatre and dramaturgy (e.g. Bentley 1964) have thus argued that this possibility of the other implies that our actions always contain an element of *performance*, since an integral part of up-bringing in a social culture is to internalise an understanding of others that comes through in our actions as well as in our thoughts. Bentley recapitulates this staging of performance accordingly: "The theatrical situation, reduced to a minimum, is that A impersonates B while C looks on. (...) Impersonation is just half of the little scheme. The other half is watching – or, from the viewpoint of A, being watched. Even when there is actually no spectator, an impersonator imagines that there is, often by dividing himself in two, the actor and his audience. The very histrionic object, the mirror, enables any actor to watch himself and thereby to become C, the audience.

And the mirror on the wall is only one: the mirrors in the mind are many" (Bentley 1964:150). As for interaction relations, our experience is directed towards and co-constitued by *technology*. In line with a pragmatic understanding of technology (Hickman 1992), we refer to technology in an inclusive sense, in that we understand it as the use of any instrument or tool to carry out an action and/or transform our relation to the world. Technology can thus refer to the use of a high-tech object, but it can also refer to less concrete phenomena such as the use of e.g. a computer programming language to construct an algorithm. The subject-technology relation is dialogical and reciprocal, in that technology can simultaneously be constitutive of our experience of the world (e.g. the use of a computer mediates certain encounters with the world) and an instrument for altering future experiences (e.g. the use of transportation technologies to facilitate experiences of different spaces). In that technology is of this dual conceptual-material nature and affect not just our actions in the world, but also our experience of it, we cannot discount the role of technology in understanding atmosphere.

An expanded analytical model of atmosphere

On the basis of our exploration of atmosphere studies and interaction design in the above, we propose an expansion of Böhme's analytical comprehension of atmosphere in order to address a concept of atmosphere that incorporates the roles of technology and others, as illustrated in Figure 4.

Although the subject-space relation is still at the core of the model, it is crucial for interaction designers to address the manners in which technology and others come into play, in part because they can contribute to the establishment of space and atmosphere, in part because these are aspects that designers can shape and influence in the design and staging of interactive environments.
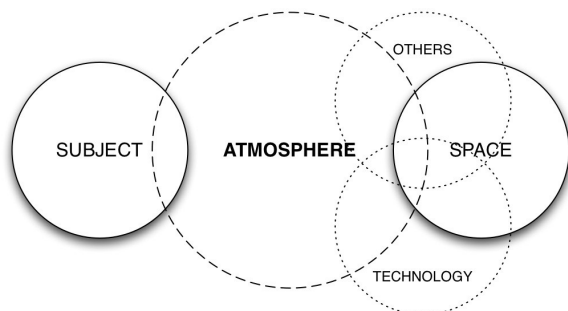

Figure 4: An expanded analytical model of atmosphere in interaction design. Here, the sensual, social and interaction relations are enclosed in the notion of atmosphere.

The temporal aspects of atmosphere are not visualised in the model, however, none of the components exist in a vacuum of time, but atmosphere emerges and transforms in the interrelations between the constituent components.

In the following sections of the paper, we will utilise the model as a means for analysing two specific design cases. The cases are quite distinct in their aims, setups, and use of technologies. They do, however, have the common trait that they employ interactive technologies to stage atmospheres in urban settings. Each of the authors have taken part in the design and evaluation of one case. The analytical model of atmosphere has been developed after the design of the two cases in an attempt to ground and scaffold analyses of atmosphere. Thus, the model has not been employed as an operational tool for incorporating the notion of atmosphere in the interaction design process. Doing so would be a logical next step in our work; however, we will leave discussions of how this may be done for future papers. In our presentation and analysis of the two cases, we will focus on the manners in which space, technology and others have contributed to the establishment and perception of atmospheres; i.e. we will not discuss the subjective dimension in itself, but rather unfold it in the discussions of the other dimensions of the model.

AARHUS BY LIGHT

Aarhus by Light[2] was an interactive media façade custom-designed for Concert Hall Aarhus in Denmark with the intention of engaging local citizens in new kinds of public behaviour in order to explore new possibilities of digital media in urban life. Visitors in the park were met with the spectacular view of animated creatures crawling around the structure of the glass façade along with a constantly moving outline of the skyline of Aarhus, and by stepping into specific interaction zones, visitors would have their silhouettes appear on the façade, enabling them to interact with the creatures.

Space

Aarhus by Light was placed at a prominent façade in a central public park in Aarhus. The park traditionally serves more as a transitional space than a place for idling. It is traversed by a number of pathways for pedestrians and cyclists, and it is flat and open, the vegetation consisting mostly of grass and low, closely

2   Aarhus by Light was developed by CAVI, Martin Professional, Concert Hall Aarhus, The Animation Workshop, and Wall of Pixels as part of the research project Digital Urban Living.

cut shrubbery in between the pathways. The façades of the surrounding buildings, rather than the park itself, constitute the most interesting features of the space. Most prominently among these is the façade of the concert hall which has won several architectural awards.

Figure 5: Visitors interact with Aarhus by Light.

One of the key challenges for introducing an interactive installation into this place was thus to alter the atmosphere and practices of the place in order to facilitate social interaction, all the while respecting the surrounding architecture. We approached this challenge by developing an installation which did not transform the space in a tangible way, rather it created what Manovich (Manovich 2006) denotes augmented space, a physical space overlaid with digital information. A number of experiments were carried out in order to explore the fit between this layer of augmentation and the pre-existing spatial and architectural components. These explorations involved studies not just of the layout of the park and the buildings, and their scale and relations, but also of the vectors of sight and movement of the wide array of visitors and passers-by in order to understand the impact that the installation would have on the perception of the space. In relation to spatial aspects of atmosphere, two important design choices were made on the basis of these explorations:

The first was to create an augmented space that would mirror the world on the outside of the concert hall and establish the sense of another world through the façade. Since the façade is made of glass, it was possible for visitors to get a glance of what lay beyond. We sought to play on this spatial perception by using an LED technology which was very transparent, i.e. when the individual LEDs were switched off, users could see through the façade. Further building upon the notion of mirroring and alternative worlds beyond the glass, the depicted skyline consisted of recognisable landmarks from Aarhus, and obviously the silhouettes of users represented on the façade would mirror the movements and gestures of users.

The second was to establish certain stages for engaging

this augmented space. This was done through the use of coloured carpets that covered the three interaction zones. The colours of the silhouettes on the façade would match those of the colours upon which users were moving, thus creating a clear mapping between the two spaces. Our subsequent analyses covered in depth in (Brynskov et al. 2006) show that the integration of Aarhus by Light into the Concert Hall's façade formed the basis of new use-patterns in and around the Concert Hall. In this perspective the interactive media façade, in combination with the Concert Hall and the park area, became a stage for new forms of interactions.

Technology

The technological dimension of Aarhus by Light played a large part in the constitution of the space of the park. The primary technological component was 180 square meters of semi-transparent LED screen that was fitted unto the large glass façade of Concert Hall Aarhus. When visitors walked through the park, they passed through three interaction zones marked with coloured carpets. Once on the carpet, a sensor picked up the outlines of your body and hereby creating a silhouette on the screen. This silhouette encouraged an investigation of the installation among the users, while enabling them to interact with the creatures by pushing, lifting and dropping them.

The creatures had pre-programmed algorithms that would determine their actions in given situations. Even though the creatures were all guided by the same set of instructions, there was no over-all plan determining the collective action of the creatures; rather each creature was an autonomous agent, reacting to its immediate surroundings. E.g. if no other creatures or user silhouettes were present, there was a high probability that it would lay down and sleep. If other creatures were present, it might dance with them, kiss them, kick them, etc. If user silhouettes were present, it might wave at them, kick them, climb onto them, etc.
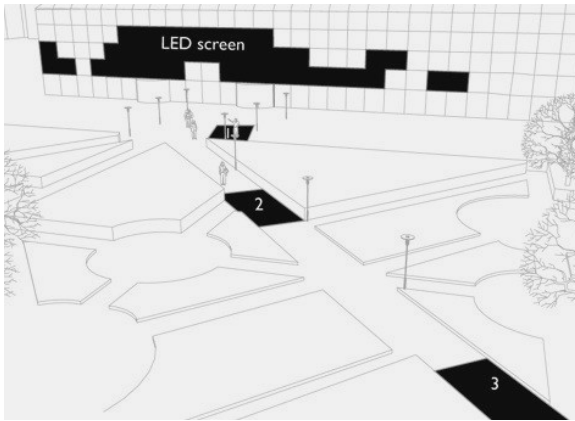
Figure 6: Interaction zones in the park.

With regards to atmosphere, the introduction of technology established an interaction relation to passers-by that radically altered the experience of being in the park. In a straightforward sense, the installation resulted in a new visual impression of the centre-piece of the park, the concert hall façade, especially at night-time during which the creatures and the sky-line were very prominent. The main achievement of the installation in altering the atmosphere of the park was, however, related to the interaction relation, which fostered curious and playful explorations from visitors, who would engage the installation in the three interaction zones. This helped establish a vivid and enjoyable atmosphere in the open public space which had previously served mainly as a transition area between other parts of the city centre. In this respect, the introduction of Aarhus by Light gave the park a distinct and lively character.

Others

A specific motivation for creating Aarhus by Light was to examine the social relations that would form around a large-scale public media façade. Given the focus of this paper, we shall focus on the social aspects as they relate to the concept of atmosphere. The most evident impact on the atmosphere of the place was that the installation caused a radically different practice than had existed beforehand, namely that of either observing other users of the installation, entering into the interaction zones to interact with the creatures (thus lending oneself to observation and scrutiny from others), or engaging in social relations with other users, either in the same interaction zone or across zones. Aarhus by Light had a high degree of situational interaction flexibility in that the installation facilitated a very wide range of social interactions and mediated the transition between these levels of interaction. In our relational understanding of atmosphere, this social mediation played a major role in the constitution of the atmosphere of the park. Revisiting Bentley's description of performance (cf.

Bentley's "the mirrors of the mind are many") (Bentley 1964:150), users of Aarhus by Light would, consciously or subconsciously, always be aware of the actual or potential presence of others, and the staging of the interaction thus greatly influences the experience of the atmosphere.

"… always performing in front of imagined or real others when she interacts with the system in public space. She puts herself on the line and becomes a performer of her own perception. Implicitly, an interactive system becomes the stage for not only the user's perception of the system but for her perception of her own act of performing in and with the system." (Bentley 1964:150).

GAMA – ON THE TRAIL OF UNKNOWN LAND

Introductory description

"GAMA – On the trail of unknown land"[3] is a mobile urban audio drama that lets the user become the main character in a theatre play staged in a real urban environment – the city of Horsens, Denmark. The objective of the project was to develop an engaging experience of the city and its history and venues utilising interactive technology.

The user becomes a medical student, Christian, who is on his way to his sister's funeral. On his way to church, Christian receives a mysterious phone call from a woman who claims to have a message from his sister, Johanne. The woman claims to be Anna Christina Bering, the long-dead wife of a famous explorer, Vitus Bering, who was descended from Horsens. The user is not only the main character in a psychological treasure hunt; he is also provided with historical facts of the city through his quest for messages from his late sister.

Space

The narrative of the audio drama has been carefully written based on the physical surroundings in which the user finds him- or herself. Each scene is linked to a given physical setting in the city. In this manner, the streets of the city are augmented with a narrative layer, which alters the experience of walking the streets and by this, altering the atmosphere of the streets into a part of the drama. The experience of the play is constituted not only by the script and what the users hear in the headsets, however, the atmosphere of the city is also an

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3 GAMA has been developed for VisitHorsens.dk by Theatre Katapult and Center for interactive Spaces, and is further described in (Hansen et al. 2008).

important part of the experience. The city becomes the stage of the drama, and every house, street, event or person encountered by the user is a potential part of the play, and thus act as elements to sense and be aware of. One of the locations the user visits is the Museum of Money ("Pengemuseet"), where he or she needs to find two keys in a draw in order to open safe box number 327. In the box the user will find an envelope with a letter which is the next clue, and the keys and letter are just a few examples of the physical objects the user encounters on his or her quest - objects that contribute to the situated experience in the staged space. Some of the objects are technologically augmented – e.g. an old radio playing a radio interview, whereas others are merely everyday objects that are staged accordingly to the story creating an authentic experience of being there yourself.

Figure 7: Finding safe box number 327. Photo: Johan Oettinger.

The fact that the play is mediated through interactive technology makes it possible to engage the user in the narrative in an embodied manner (Dourish 2001), which differs from the type of engagement that is experienced while seated in the space of a theatre watching a traditional play. The users get to act actively and bodily being part of a dynamic atmosphere. However, regarding the sensuous relations, the atmosphere of the traditional theatre hall can be controlled in a manner which is much less possible in the street. In the theatre all the seats are directed towards a stage, and the walls, ceilings, flooring etc. outside the stage area are usually toned down in colours and materials allowing the full attention of the audience to be directed towards the stage. In the streets numerous unmanageable factors can beckon the users' attention, e.g. accidental passers-by, shop windows, market stalls etc. Further, the weather situation can have an impact on the atmosphere and experience of the play.

Technology

Before the play begins the user is equipped with a

mobile phone, a headset and a street map. In order to experience the play, the user is guided to 14 Semacode[4] based tags (2D bar codes) placed at various locations in the city. Each time the user has taken a picture of a tag, an audio fragment – one of the 14 scenes of the drama is triggered. Actors' voices appear in the mobile phone headset, including the thoughts of the main character, Christian, making the user identify him- or herself with - and act as - the main character of the plot. During the play, the user receives text messages and phone calls as part of the plot which in that respect makes the mobile phone an integrated prop in the play. In addition, the user is met by "real" actors, which also enhances the feeling of being an immersed character in the plot. Future work on integrating technology as part of a staged atmosphere includes integrating more sensors in the physical environment – making the buildings "come alive", e.g. when a user enters one door something happens that differs from what would have happened if the user had chosen another door.

Others

The drama of GAMA is a single user experience and according to the dramaturges who wrote the plot, the fact that the user wears headphones during most of the play means that it is easier for the user to identify him- or herself with the main character. A user evaluation on GAMA has shown that the users are quite absorbed in the story due to the fact that they wear headphones, and are thus exposed to an intense audio experience. This experience even caused a few of the users to burst out into tears at the end of the play, when the user is met by the deceased Johanne at the churchyard – embodied by a real actress.

With regards to designing for social aspects of atmosphere, in one of our recent projects, HasleInteractive (Hansen et al. 2008), we have combined this single user approach with a collective one, where school children are assigned different characters in the same play. Some parts of the play are to be heard individually wearing headphones; however, group work is part of the plot where the children act their character while working together on specific tasks. In a mobile urban drama, the city is the stage, the interior are the props and the people walking the streets are the actors or extras - staring the user as the main character. The user becomes aware that the city is staged accordingly to the story when he or she learns that the plot is integrated in the urban settings; and that the people he or she encounters while exploring the city could be part of the play - but in most cases are passers-

4   http://semacode.com/.

by unrelated to the story. This uncertainty - whether a passer-by is an actor/actress or not, gives the relation between user and others an interesting twist. The spectators cannot hear the audio fragments played in the users' headphones, and even if they would see the users taking pictures of Semacodes they most likely would not know that the users were experiencing a theatre play. In this manner, designing for the spectator experience as argued by (Reeves et al. 2005) is a problematical matter in this particular case. The fact that the users are wearing headphones does not invite others to interrupt them and ask them what they are doing. However, had the spectators been able to hear the audio in a shared audio space - not only would the spectators' experience have been different – so would the users' experience. It can be argued that a psychological narrative told from the user's perspective is only suited for a single user experience, however, the design will always be informed by potential spectators who are indirectly part of the design, even if they are not aware of it. Further, the user will always be aware that potential spectators could be looking at him or her wandering what he or she is doing and will act accordingly to being in a shared public space (Bentley 1964).

Figure 8: The user is caressed by Johanne, the deceased sister. Photo: Johan Oettinger.

CONCLUSION

The analytical model of atmosphere has been established in an effort to understand the notion of atmosphere in urban interaction design. For this reason, we have expanded the focus of traditional atmosphere studies to encompass the dimensions of technology and others, as well as to emphasise the temporal dimension of atmosphere. The development of the model can thus be seen as an exercise in fusing two previously distinct topics of inquiry. Being interaction design researchers, our primary concern has been to use the model to analyse two cases of interactive installations in the cityscape; we thus regard our work primarily as a contribution to the field of interaction design, rather than to that of atmosphere studies. Our work has been

motivated by the fact that the notion of atmosphere is all but ignored within interaction design, although there is an increasing interest within the field in addressing physio-spatial as well as experiential aspects of computing, at the very cross-section of which lies the phenomenon of atmosphere.

The critical question, then, is what insights were gained from the development of the model and its application to the two cases. First of all, articulating "atmosphere" has emphasised the importance of understanding the nature of the genius loci – the spirit of the place – both before and after interactive systems and installations are introduced into it. Given the relational character of the model, our analysis has been focused on the situated and unfolding relations between the dimensions; in this respect, the means of staging atmospheres are not as clear-cut and instructive as the model might imply. Quite the opposite seems to be the case: The relational model has led us to consider that the spatial, social, sensual, interactive and temporal concerns converge in atmosphere, and that changes in one may cause shifts in the others and ultimately in the character of the atmosphere. This being said, the model is, however, instructive in pointing out salient traits in what constitutes atmosphere. In both cases, we have found that, as interaction design researchers, our main means of staging or altering atmospheres stem from the technological dimension. E.g. in the case of Aarhus by Light, the installation did not physically alter the space of the concert hall park, but the virtual augmentation of the space led to a different perception of the space and to new and emergent social encounters. Likewise, the GAMA project did not change the physical surroundings of the streets or venues of Horsens, however, the narrative of the drama, and the fact that the users were actively integrated in it while exploring the city, provided the users an alternative experience of the city and its atmosphere that could not have been staged on the stage of a theatre.

A seemingly reasonable concern, given our expansion of the notion of atmosphere, is whether our model of atmosphere is too inclusive; i.e. can every place be said to exhibit atmospheric traits? Upon closer scrutiny, we will claim that this question does not only relate to our model, but also to traditional notions of atmosphere; the inclusion of technology and others does not, in our view, dilute the notion. The question remains; our best response is a pragmatic one, namely that whether or not a place may be construed to have atmosphere is a question of what is relevant to the inquiry at hand. In the case of urban interaction design, we will argue that it will probably be highly relevant in a large number of

cases. Since the model was developed on the basis of discussions and reflections upon the two cases, it is primarily an analytical construct. This means that the model is intentionally reductionistic for the sake of clarity; e.g. a number of relations in between the different dimensions exist, but we have largely left them untouched in this paper, although we have been tempted on more than one occasion to expand the model. Furthermore, the post factum development of the model means that we have not experimented with how to employ it pro-actively in design. The logical development of our work is to operationalise the discussions presented in this paper and explore how to integrate the notion of atmosphere in design processes.

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