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Networked Mobilities and Performative Urban Environments

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ABSTRACT

Physical mobility has an important cultural dimension to contemporary life. The movement of objects, signs, and people constitutes material sites of networked relationships. However, as an increasing number of mobility practices are making up our everyday life experiences the movement is much more than a travel from point A to point B. The mobile experiences of the contemporary society are practices that are meaningful and normatively embedded. That is to say, mobility is seen as a cultural phenomenon shaping notions of self and other as well as the relationship to sites and places. Furthermore, an increasing number of such mobile practices are mediated by technologies of tangible and less tangible sorts. Thus by focusing on the complex relationship between material and virtual technologies within the sphere of mobility it is shown that we need to move beyond dichotomies of; global or local, nomad or sedentary, digital or material. The paper investigates the meaning of mobility and the potential in mediation and technologies to enhance the experiences and interaction in relation to urban transit spaces. In understanding the importance of mediation, global-local interactions, networks, and the distributions of meaning and mediated discourses this way of thinking about mobilities points to the importance of understanding pervasive computing and situated technologies. In particular a critical awareness to how such technologies shape the foreground/background attention of social agents seems crucial. By studying embedded technologies and 'ambient environments' we increase our knowledge about the over layering of the material environment with digital technologies. The presences of GPS, mediated surfaces, mobile agents (robots), RFID and other technologies that all relate to contemporary mobility practices add a new dimension to the notion of movement and constitutes new arenas and tools for identity construction and social interaction (as well as of course commercial exploitation and state control). In the creation and design of new interaction spaces applying urban technology there is a potential for conceptual critique but also for discussing these mediated sites of interaction as venues for new meaningful social interaction and relationships ultimately shaping new ways of thinking about the political. It is argued that the design and experimentation with '*performative urban environments*' constitutes a field of exploration into broader issues of democracy, multiple publics, and new mobile (electronic and material) agoras pointing towards a critical re-interpretation of contemporary politics of space and mobility.

Networked Mobilities and Performative Urban Environments

Ole B. Jensen, Aalborg University

For a long time architecture was thought of as a solid reality and entity: buildings, objects, matter, place, and a set of geometric relationships. But recently architects have begun to understand their products as liquid, animating their bodies, hypersurfacing their walls, crossbreeding different locations, experimenting with new geometries. And this is only the beginning. We will see more and more architects realising spatialised moments, through staging narratives, through event designing, working with effects and emotions. (Bouman 2005:22)

1. Introduction and background

Physical mobility has an important cultural dimension to contemporary life. The movement of objects, signs, and people constitutes material sites of networked relationships. However, as an increasing number of mobility practices are making up our everyday life experiences the movement is much more than a travel from point A to point B. The mobile experiences of the contemporary society are practices that are meaningful and normatively embedded. That is to say, mobility is seen as a cultural phenomenon shaping notions of self and other as well as the relationship to sites and places. Furthermore, an increasing number of such mobile practices are mediated by technologies of tangible and less tangible sorts. Thus by focusing on the complex relationship between material and virtual technologies within the sphere of mobility it is shown that we need to move beyond dichotomies of; global or local, nomad or sedentary, digital or material. The paper investigates the meaning of mobility and the potential in mediation and technologies to enhance the experiences and interaction in relation to urban transit spaces.

In understanding the importance of mediation, global-local interactions, networks, and the distributions of meaning and mediated discourses this way of thinking about mobilities points to the importance of understanding pervasive computing and situated technologies. In particular a critical awareness to how such technologies shape the foreground/background attention of social agents seems crucial. By studying embedded technologies and ‘ambient environments’ we increase our knowledge about the over layering of the material environment with digital technologies. The presences of GPS, mediated surfaces, mobile agents (robots), RFID and other technologies that all relate to contemporary mobility practices add a new dimension to the notion of movement and constitutes new arenas and tools for identity construction and social interaction (as well as of course commercial exploitation and state control). In the creation and design of new interaction spaces applying urban technology there is a potential for conceptual critique but also for discussing these mediated sites of interaction as venues for new meaningful social interaction and relationships ultimately shaping new ways of thinking about the political. It is argued that the design and experimentation with ‘*performative urban environments*’ constitutes a field of exploration into broader issues of democracy, multiple publics, and new mobile (electronic and material) agoras pointing towards a critical re-interpretation of contemporary politics of space and mobility.

The paper is structured in the following order. After the introduction and background we briefly in section 2 present the theoretical perspective of mobility moving “beyond A to B”. In section 3 we

draw up the framing of mediated networked technologies and proceed in section 4 with a working definition of the central notion of 'Performative Urban Environment' (PUE). In section 5 we illustrate elements of performativity in urban setting by a list of international examples. From here we in section 6 and 7 move to two cases coming out of teaching and researching at Aalborg University; the NoRA pavilion and the MAUTS robot project. The paper ends with a short discussion and some concluding remarks in section 8.

2. Mobility Theory – more than A to B¹

In this section we shall point to a few of the latest theoretical and conceptual attempts to frame and understand contemporary mobility. However, even though much research is being conducted on the importance of understanding mobility in relation to the geographical and the social realms of society (Cresswell 2006, Graham & Marvin 2001, Jensen 2006, Urry 2007), we could argue for an understanding of mobility as particular dependent on interactive technologies and socio-technical systems since '*... the powers of 'humans' are always augmented by various material worlds, of clothing, tools, objects, paths, buildings and so on*' (Urry 2007: 45). Here we will focus on three themes; *flows and mobility, technologies and place, and the Re-configuration of the public and the political*. Arguably much more should be said about this, but here the main point will be to frame key issues of relevance to bring out a deeper understanding of the cases of performative architecture that we will discuss in the paper.

Flows and mobility

In this section we are interested in showing some of the arguments present in the theories of the fluids and mobile city. In particular we will put an emphasis on seeing mobility as having unexplored potentials for community-making by crossing socio-technical systems. According to Amin and Thrift we should start out by acknowledging a new way of thinking about the city in the first place:

'We have begun to see how urban life is placed by lines of mobilities and travel and by namings and imaginaries ... The city thus needs to be seen as an institutionalised practice, a systematized network, in an expanded everyday urbanism ... an ontology of encounter or togetherness based in the principles of connection, extension and continuous novelty ... In such a conception, the city is made up of potential and actual entities/associations/togetherness which there is no going beyond to find anything 'more real' ... In other words, it belongs to the nature of a 'being' that it is a potential for every 'becoming' (Amin & Thrift 2002:26 & 27)

Understanding the new importance of mobility and flow to the contemporary urban situation is however not as new as it might seem. Already Lynch noted for example, that not only were the flows of the city essential to its meaning and functionality but as important – mobility was a positive and essential experiential feature of the city:

'Travel can be a positive experience; we need not consider it pure cost ... Travel can be a pleasure, if we pay attention to the human experience: the visual sequences, the opportunities to learn or to meet other people' (Lynch 1981:274)

¹ The first three subsections in this section are drawn from Thomsen & Jensen 2008.

From such a rehabilitation of mobility as meaningful and culturally important grew a contemporary critique of seeing infrastructure as purely instrumental. The networked mobility seems to have become a new ground condition for much contemporary urban experience and thus demands new theoretical reflections:

'Moving physically while keeping the networking connection to everything we do is a new realm of the human adventure, on which we know little' (Castells 2004:87)

Arguably the networked mobilities of contemporary urbanism are producing and re-producing complex relationships between physical location and socio-technical systems of infrastructure. It is in the mediated meeting between technology and place that the performative urban environments start to materialise.

Technologies and place

Physical space is being over layered with mediated technologies of all sorts, creating a situation of 'augmented space' (Manovich 2006). This, however, is by no means related to the 'end of geography' or the seamless and frictionless utopias analysed in the literature (Jensen & Richardson 2004). Rather, we see a situation where sites are mediated by 'local protocols' (McCullough 2002) and where;

'... spatially dispersed yet coordinated, fluid collections of wirelessly interconnecting individuals – perhaps assembled, from the beginning, in cyberspace rather than at any physical location – are becoming a crucial fact of urban life' (Mitchell 2003:161)

The understanding of the interdependence of technologies and mobilities are essential to understanding how place increasingly becomes mediated and thus 'produced' by technologies. Furthermore, such an understanding must include a notion of a relational geography which lays a stress in movement, fluidity and 'mixity' (Massey 1999:161).

Fig. Conceptions of spatial configuration On the left, a 'homogeneous conception,' where proximity is even as spaces are located 'next to each other'. On the right, a heterogeneous conception, a consequence of the insertion of communication technologies; here, proximity is determined by the medium of communication.

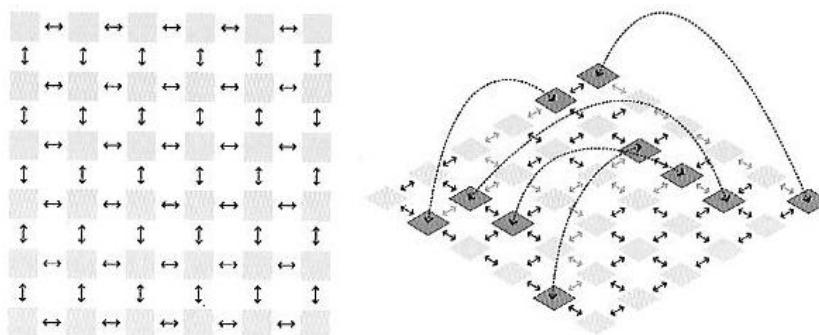


Figure 1: Homogeneous or Heterogeneous conceptions of spatial configuration (Pinilla 2007:89)

The situation may be described as one of 'emergent urbanism' (Pinilla 2007). It is a situation where the fixed hierarchy of global and local becomes blurred and the notion of 'scale' becomes more a question of mediation, networked selection and mobility. Thus we may say that we move from a

situation of homogenous and fixed conceptions of spatial configurations towards a situation of heterogeneous and fluid conceptions of spatial configurations (see figure 1).

The key point being that in the heterogeneous model proximity is defined by selective and filtered mediation. In other words, the networked relationship and the layers of communication may (to a certain extent) compensate for a lack of physical proximity. At least it is safe to say that in the heterogeneous model sites become defined by the degree of mediation and networked links – or bypasses. So rather than subscribing to a notion of ‘end of geography’ and footloose visions of cyberspace, we want to point to the increasing (but clearly transformed) important relationship to material and physical sites. What happens to notions of ‘place’ in such a context? According to Thrift:

‘The short answer is – compromised: permanently in a state of enunciation, between addresses, always deferred. Places are ‘stages of intensity’, traces of movement, speed and circulation’ (Thrift 1996:289)

So place is defined by the flows and fluids either crossing through it or for various reasons bypassing it (e.g. powerful software selection or physical decoupled sites). However, this does not mean that we should seize to include the fixed and the permanent in our theoretical understandings. Rather, flows needs fixity (McCullough 2004) or as Urry argue:

‘... it is the dialectics of mobility/moorings that produces social complexity. If all relationality were mobile or ‘liquid’, then there would be no complexity. Complexity, I suggest, stems from this dialectics of mobility and moorings (Urry 2003:126)

We would argue that within such a re-configured situation of flows and places where new socio-technical systems produced new hybrids between place and flows, between technology and place, and between communities and technology there is a new role for understanding the political city and the notion of ‘shared’ space and public domains. Within such new hybrid systems of place and flow we may start to think of the notion of ‘Hertzian landscapes’ (Mackenzie 2006:141) as a way of understanding the mediated ground condition for performative urban architecture.

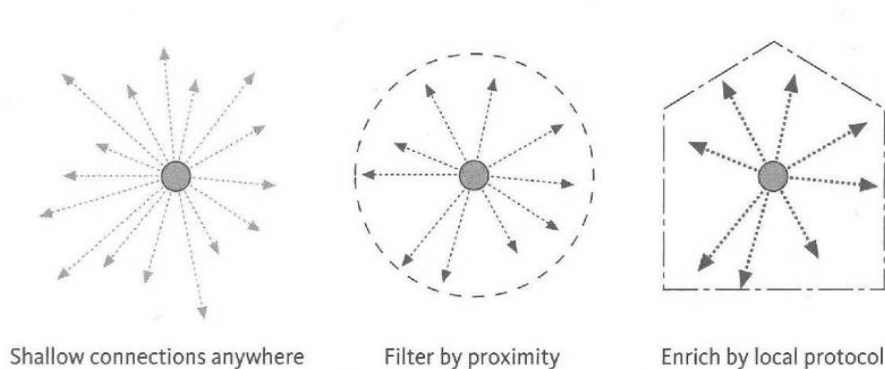


Figure 2: ‘Enrichment by local protocol’ (McCullough 2004:142)

However, just as we do not see the value in thinking about a placeless understanding of the new media and technologies, so we would also argue that an unrestricted and information-flooded

condition makes no sense. Only by selection, placement and challenging networks does it make sense to think about mediated places and technologies. In the words of McCullough there is a need for 'local protocol' (see figure 2). The point being that heterogeneous conception of spatial configuration we saw presented in Pinilla's figure at a more local level is requiring selection, boundaries, and structures – in McCullough's words 'grounding'.

Re-configuration of the public and the political

In the contemporary mediated city of flows we need to rethink the political and the notion of the public. In new hybrids relationships between technologies and humans potentials (as well as dangers) arises. In understanding the potentials of performative urban architectures we may start by re-interpreting the notions of 'public' spaces. To us the investigation into if sites facilitates interactions between different social groups and thus constitute a 'public domain' (Hajer & Reijndorp 2001) is more important than keeping the fictitious vision of just one public space alive. In the contemporary city of flow a new discussion about interaction and mediated spaces must be opened:

'The expanded and mobile city implies a new agenda for the design of public space, not only in relation to the urban centres or in the new residential districts, but especially in the ambiguous in-between areas ... Furthermore, we seem to think too much about public space in the sense of fixed and permanent physical spaces, and we give insufficient consideration to the way in which public domain comes into being in flux, often extremely temporarily' (Hajer & Reijndorp 2001:14 & 16)

To us this suggests itself as an idea relatively compatible with the critique of the modernist notion of the city as one of homogenous communities. From their engagement with mediated urban spaces and the new situation of political articulation Crang and Graham argue for a 'politics of visibility' in which performative installations and art forms experimenting with technologies in the city may become a political platform for exposing the pros and cons of mediated and situated technologies (Crang & Graham 2007). Seen this way, the politics of visibility is about using the new performative urban architectures as windows into a discussion and awareness about the opportunities and threats that cities face. The technologies themselves need to become visible to the communities for them to realise the field of action they offer. Or in the words of Shelley and Urry:

'In many ways, then, the reconfiguration of complex mobility and communication systems is not simply about infrastructures but the refiguring of the public itself – its meanings, its spaces, its capacities for self-organization and political mobilization, and its multiple and fluid forms' (Sheller & Urry 2006:8)

There is a new dynamics between place, mobility, technology and the political that we think needs to be taking into consideration. It is a notion of thinking about this relationship as mediated and open indeed, but equally as related to ideas about belonging and identity. In the words of McCullough:

'... at least to the more mobile and networked of us, place has become less about our origins on some singular piece of blood soil, and more about forming connections with the many sites in our lives. We belong to several places and communities, partially by degree, and in ways that are mediated. With the rise of pervasive

computing, more applications must enhance, and not undermine, our perceptions of grounding place' (McCullough 2007:388)

Here we shall claim that the socio-technical systems orchestrating and mediating flows are the important sites of the production of lived everyday life mobility that need attention.

The production of lived mobilities within socio-technical systems²

The analytical understanding of mobility systems and how they shape the conditions to mobile urban subjects has much bearing on the new development of theories dealing with power, politics and mobility. However, the understanding of how this produces on-the-ground mobility we need to add the perspective of seeing these as a socio-technical system (Galis 2006). Only by understanding how the assemblage of human and non-human elements within a larger socio-technical system works can we claim really to have understood the production of lived mobilities (Valderrama & Jørgensen 2008:203). The profoundness of the assembling of urban mobility reaches well beyond the ordinary as it carries repercussions to ontological assumptions of space and time:

'Newtonian conceptions of space and time determine a commonsense notion that transport systems are the means to achieve mobility in a certain space, which is defined by natural principles and boundaries. Such conceptions are often found in the literature on transport systems and transport planning and translated into models of transport behaviours and needs. However, more sophisticated conceptions invert the relation and state that space is the outcome of different ways of being, affecting and organizing others' (Valderrama & Jørgensen 2008:215)

Movement in the city is social to the extent that we need to pay attention to the 'mobile other' (Jensen 2006). Certainly the mobility practices of everyday life are related to 'ways of doings' in the sense of particular practices, norms, codes, rationalities, cultures and knowledge-forms (Jensen 2006). But there still seems to be a need for creating space and leverage in the theoretical understanding to reverse the interpretation of mobility spaces. This understanding grows out of an attempt to re-valorise the numb objects and technologies that makes mobility:

'Our collective is woven together out of speaking subjects, perhaps, but subjects to which poor objects, our inferior brothers, are attached at all points. By opening up to include objects, the social bond would become less mysterious' (Latour 1996:VIII)

Like the 'sociogram' may chart human interests and translations we should have to add the so-called 'technogram' in order to chart the 'interests and attachments' of nonhumans (Latour 1996:58). The report on the conditions of technology in producing mobilities should be held against the insight that '*a technological project is not in a context; it gives itself a context, or sometimes does not give itself one*' (Latour 1996:133). As inspired by Latour's way of thinking we want to add a particular way of seeing the 'subject' within such a socio-technical system:

'What we are exploring within these complex nexuses of physical infrastructures and technology, cultural norms and legal regulations, design codes and architecture, social practices and interaction are in fact the creation of what might be termed 'mobile

² This section is based upon the paper 'European Metroscapes' by Jensen (2008).

subject types'. By this is meant the production of relatively clear and well defined categories of imagined mobile citizens in the socio-technical nexus of infrastructure systems' (Richardson & Jensen 2008:218)

We shall argue that the 'mobile subject type' imagined within plans and policies may be manufactured to a certain extent. However, it should become increasingly clear that the social cannot be 'closed' and thus completely determined. Armature spaces might work as 'heterotopias'(Foucault 1997) in the interpretation, valorisation and practices of the everyday life of mobile urbanites where their imagined mobilities are predicated upon, and are used to make thinkable and normal, new technologies of mobility' (Richardson & Jensen 2008:220-221).

So the creation of mobile subject types unfolds in this dialectic space between the state's will to orchestrate urban mobility, and the multiple actual coping practices and strategies of the individual in his or her daily moving through the city. The introduction of new transport infrastructure, then, creates new conditions for social 'condensation' as socio-technical systems create interfaces between the view from the state and the practices of everyday life. Accordingly the production of mobile subjects takes place between the policy and everyday life level and is mediated by infrastructure (Richardson & Jensen 2008:221-222). Also this connects to the argument put forward by Cresswell that mobility has to do with movement + meaning + power (Cresswell 2006). To Cresswell it is important to understand the 'more than A to B' of mobility as related to the making of meaning and the exercise of power. Here we shall add that the making of meaning is about the creation of mobile cultures. In prolongation of the socio-technical approach Thomsen and Jensen points at the need for understanding how the Cartesian split between objects and subjects becomes a hindrance to seeing how lived mobility is produced (Thomsen & Jensen 2008).

3. Mediated and networked technologies

In understanding the importance of mediation, global-local interactions, networks, and the distributions of meaning and mediated discourses new ways of thinking about mobilities are called for. In particular a critical awareness to how such technologies shape the foreground/background attention of social agents seems crucial. By studying embedded technologies and 'ambient environments' we increase our knowledge about the over layering of the material environment with digital technologies. The presences of GPS, mediated surfaces, mobile agents (robots), RFID and other technologies that all relate to contemporary mobility practices add a different dimension to the notion of movement and constitutes new arenas and tools for identity construction and social interaction (as well as of course commercial exploitation and state control).

Analysts of the contemporary situation points to the fact that the previous obsession with the 'virtual' and cyberspace where technology took off as if were from the physical environment has come to be replaced with a beginning awareness of the importance of the location, the placement and the situated (Crang & Graham 2007, Manovich 2006, McCullough 2004). Rather than working within separate domains new media and technologies overlay the physical world of places, houses and infrastructures. Thus creating a situation where the physical placement of social agency and the technology at hand becomes crucial. Much of the engagement with technologies in this way we find in sites of transit and mobility. As we move across cities utilizing numerous networked technologies to navigate, coordinate and facilitate our trajectories potentials for new experiences might occur in these new sites of mediated interaction. Needless to say, new means of control and power also loom within the potential of the new 'augmented spaces' (Manovich 2006).

In this paper we argue that it is important to understand how the networked technologies relate to contemporary urban mobility and offer potentials for transgressing mobility as ‘waste of time’ or instrumentalism at the same time as they are power-laden and oscillates between state control and market consumerism. The challenge for a social science engaging with design is to analyse and discuss networked urban mobility as ‘more than A to B’ (Urry 2007). Travel can be a positive experience and we need not consider it pure cost to paraphrase Kevin Lynch (1981). Mobility is a cultural phenomenon too often just seen through the eyes of planners trying to ‘fix’ congestion, accidents and so-called ‘environmental externalities’. Not realising that mobility is culture. Simultaneously such a discussion should try to point at the third space for meaningful social interaction mediated by networked technologies that goes beyond state control and market commercialism. Furthermore the critical dimension to this discussion is also to address the issue of ‘qui bono?’ As mobility is a socially differentiated phenomenon new networked sites of interaction potentially favour some groups whilst it disfavours others. What really matters is how to empower people by exploring the potentials of the new mediated technologies. But being critical also means to problematise the taken for granted notion that infrastructures always host instrumental practices that they are generic ‘non-places’ (Augé 1995). Thinking critically about the meaning of mobility in new networked sites of interaction thus has to do with uncovering power-issues (Jensen & Richardson 2004), as well as with stretching the mind towards wider and more inclusive ways of comprehending everyday life mobility. Here we shall argue for a ‘politics of visibility’ in the sense that new experiments and explorations of augmented spaces and mediated networks becomes crucial if we are discuss the pros and cons of these often ‘invisible’ technologies (Crang & Graham 2007).

In terms of not only *thinking mobilities* (analysis) but also *designing for flows* (intervention) it seems pertinent to explore the opportunities for transit spaces to become more than venues for instrumental mobility practices. The issue of how to develop and design ‘public domains’ in these spaces and with the help of multiple layered technologies is at the forefront here. The temporality and often ‘messy’ character of transit spaces need to be seen as sites of interaction between multiple publics and social groups – the very definition of public domain (Haje & Reijndorp 2001). Today’s spaces of mobility are ‘rooms’ in which we live much of our life. Beyond that the meaning of mobility is more than circulation as it becomes a culturally significant practice. Therefore sites of mobility and infrastructures facilitating these could become sites of cultural production, enhanced experience and democratic pluralism (Calabrese 2003). Meeting points, exchanges and flows of communication may be commercial and less oriented towards building public spheres (like the commercial billboards alongside the urban freeway). However, this does not rule out a potential for re-thinking the relation of infrastructures to notions of the public realm. The moving urbanite engages with multiple mobile and electronic agoras during the travel. We are linked-in-motion and thus not just passively being shuffled across town. Being-on-the-move is a contemporary everyday life condition in the city and should as such be re-interpreted. Therefore we must comprehend transit places as sites of interaction and media flows that only becomes ‘places’ in so far as flows of people, ideas, symbols, goods and material either positively flow ‘into’ these nodes in the network, or conversely for all sorts of reasons do NOT flow into the nodes.

The new mediated spaces are unfolding between many different normative ways of engaging with the social production of mobility and interaction. Assessing whether they are socially inclusive or exclusive, environmentally sound or unsound, creative or mindless reproducing established ways of thinking, if they are liberating to yet unseen communities of practice or just cementing the established lines of power and social order is an open agenda to be explored. However, this short

discussion suggests that we should aim at establishing an analytical frame capable of addressing issues of differential mobility and power, the meaning and potential of performative and mediated urban environments, the relationship between interaction and public domains in order to relate the analytical issue of ‘thinking mobilities’ to the interventionist ambition of ‘designing for flows’.

Performativity³

In recent years a set of new technologies have evolved from the influence of ubiquitous computing and mobile devices connected to increasingly more sophisticated networks. These technologies increase the performative aspects of our interaction with the city and architecture as individual contributions and preferences are increasingly being mediated through individual and mobile platforms. In this regard performativity presents the ability for an environment to act with its surroundings with both humans and non-humans as actors focusing on the collective outcome of these feedback processes mediated by new technologies. The central aspect of performativity originates from the ‘speech acts’ of Austin (Austin 1962/97), as when words ‘do’ something and meaning is constituted through an act or practice. McKenzie has tried to generalize performativity aspects (McKenzie 2001) within organization, technology and cultural performance. These many aspects deal with the overall concepts of the emergent effects of interactions in complex systems as in a society influenced by an increased amount of circulating information and cross-cultural inputs. The notion of performativity thus involves the understanding of new and more open technological systems that allow for interaction and involvement of individual actors to shape the collective experience of place through new kinds of mediating objects.

The performative technologies

To begin understanding these technologies as a contribution to the urban context and not merely another layer on-top of the existing fabric, as previous understandings of a virtual has tended to focus on, we need to additionally understand the issue of pervasive technologies and interactivity. Pervasive technologies mean that not only are the technologies ubiquitously embedded in our everyday life but also they are getting increasingly mobile and integrated invisibly into the environment while still connected to the network (McCullough 2004). As a difference to previous technologies that were merely one-way environmentally responsive in the sense that they could make changes according to pre-determined parameters, the *interactive* technologies are dynamically and making deliberate and variable response to a series of exchanges (McCullough 2004: 20).

The next step from the issue of interactive pervasive technologies is the performative aspect of these interactions, when our urban environments are increasingly getting occupied with feedback processes between various mobile agents and networks – a field recently named as *urban computing*. This leads to a beginning understanding of the emergent effects of interactions in complex environments when objects and people are naturally communicating and embedded in the same kind of networks:

‘No longer solely virtual, human interaction with and through computers becomes socially integrated and spatially contingent, as everyday objects and spaces are linked through networked computing.’ (Kahn, Scholz & Shepard 2007:4)

³ This section is based upon extracts from Thomsen & Jensen (2008).

The most significant technologies that are pushing this development is within mobile technologies with e.g. gps, gprs, bluetooth, wlan etc., which are all technologies that makes the individual mobile object able to exchange information from local to global and still influenced by its owners preferences. The first introduction of mobile telephones was as permanent devices in cars, as in the example of Ericsson, who had a terminal in his car that he could attach to wires and poles when away from his office. Later they were embedded as real cellular based mobile devices in trains before it really integrated as part of the social consciousness and youth culture in the 1990's (Ling 2008:12). These digital networks were traditionally considered as separate infrastructures that did not have any resemblance of the local environment but instead were used for long-range communication. However at the same time as the tracking technologies are getting increasingly more detailed, also at the same time new services are making short-range social networks possible through the introduction of rfid and bluetooth technologies embedded in the urban architecture. This local access creates potentials for meaningful communication with local infrastructures as part a more situated computing.

The recent upgrade of e.g. the Google services with the Walk-Score where you can make a 'walkable' profile of your neighborhood and the Street View with high-resolution images of the streets (Vincent 2007:118) are now extended into mobile phones which increases the perception of the local environments. The mobile phone is no-longer only a generic tool for communication and global gps-positioning but encompasses localized information for a more spontaneous urban navigation including the wide range of new network services to extend the mobile phone as a personalized way-finding tool with guides, social networking, real-time localized information, local remote for bill boarding etc.

At the same time as the mobile devices are getting upgraded with more situated services and connections, the urban architecture is increasingly being facilitated by a response to the presence of mobile phones thereby emphasized local feedback loops. Interactive facades as Blinkenlights and Spots on Potsdamer Platz in Berlin as well as the application from GeoVector and Microsoft focuses on the mobile as a new locative 'remote control' to physical environments, facilitating a direct manipulation of the physical environment with emergent collective impacts. The mobile phone and similar distributed and connected objects begins to influence the perception and representation of the urban environment as we are negotiation the collective presence.

Mediation through objects

To understand how these objects begin to influence the social realm and the embodiment of people in places we need a slightly revised vocabulary that no-longer sees mobile devices and interactive architectures as merely functionally optimized and materialized representations of a static understanding of the city. Instead these objects travels in between different spaces, change their appearance, circulate information, facilitate interaction and generally become focal points for a social realm through the relationships that they are enacting.

The philosopher Michel Serres uses the definition of a quasi-object as the 'third' object in this intersection between the solid and the fluid as 'a marker of the subject' (Abbas 2005: 2), 'a thing that circulates' and a 'mediating object' to fix temporary relations (Abbas 2005: 177). They exist in different variations within both the social and the architectural realm as Latour could call these objects for 'mediators' (2005: 39). In a time with increased communication and access to larger amounts of information, these quasi-objects gets even more important to investigate as through the

access we *'establish meaning, construct knowledge, and make sense of our surroundings by associating items of information with one another and with physical objects.'* (Mitchell 2003: 120) And as per Actor-Network Theory *'Each object gathers around itself a different assembly of relevant parties. Each object triggers new occasions to passionately differ and dispute.'* (Latour 2005:15). What happens we would argue is a new configuration of objects and subjects in a complex networked relationship based upon layers of mediated communication, local protocols, and feed-back systems. This is the defining characteristics of performative urban architecture (see figure 3).

4. Performative Urban Environments – towards a working definition

So what we are looking at is a phenomenon whereby technologies of both very hard, material quality as well as the virtual layers of these are being inserted into urban sites creating new opportunities for re-thinking relationships between flows and fixity, local and global, and human agency and technological artefacts. Furthermore, the networked relationships are the crucial feature creating new systems of interaction, feedback loops and mediated settings for social interaction. Thomsen tries to capture this in the figure illustrating how technologies, data processing, actuators in urban contexts may become connected in networks and interacting with local agents creating performative urban environments (figure 3).

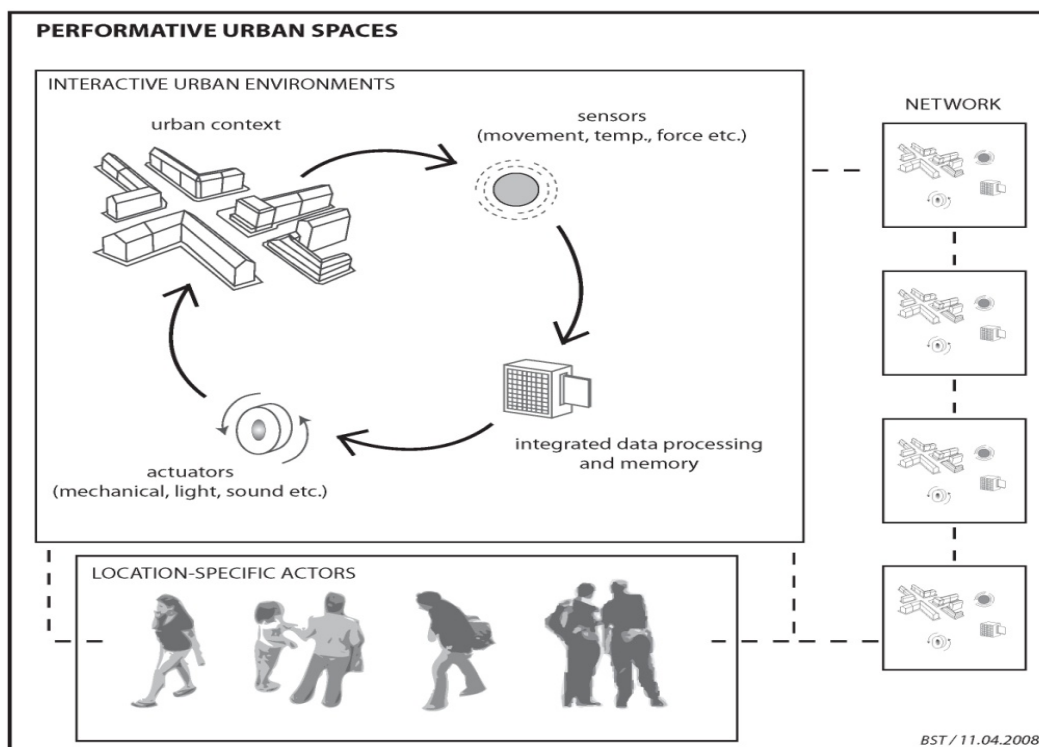


Figure 3: Performative Urban Environments (Graphics: Bo Stjerne Thomsen)

On the basis of the theoretical reflections thus far we might pause and reflect upon a working definition of Performative Urban Environments. PUE are characterised by the following four elements:

1. PUE focus on what an urban space *does* instead of what it *is* – the way in which an urban space acts with its surroundings
2. PUE are actor-networks dissolving the strict division between subject and object, between the fixed and the fluid, the global and the local
3. PUE are mediated and networked spaces where the multiple over-layering of networked technologies creates new fields for social interaction (positive as well as negative)
4. PUE are interactive and mediating

Clearly much more needs to be said and further theoretical underpinnings may become needed. However, here we now have some guidance as to how we should interpret the examples of PUE that we may engage in the empirical field.

5. International examples⁴

A number of international examples within performative arts, technology, and research are to be found. Here we shall only mention a few cases which do not all fit directly to the definition of PUE presented in this paper. Rather they are cases containing elements that combined might work towards fulfilment of the creation of PUE. As this is the early phase of researching these global cases we shall only provide a bullet point list of titles and web sites for these. In future research a detailed interpretation of each of these projects must be established:

Digital Mile: 'The project incorporates digital media in all aspects of the urban environment, with the intension to design places that respond to the present users to provide the basis for a large variety of activities, to facilitate stories and information as a service for the users. As a kind of "open-source" city it enables the users to influence the environment to become more dynamic and participatory, however maybe even more importantly to enhance the experience of social spaces. ... These activities are initiated by incorporating free wireless public networks and digital systems that change e.g. as a water wall, street surface, building façade, streetlight intensity and colour, digitally controlled urban interior pieces etc. The project shows the really prospective possibilities for architecture to go into a feedback process with the citizens ...' (<http://performative.wordpress.com/>)

Textual Healing: 'Using 'always on' technology, cell phones with SMS allow an audience to tell stories in public space through light projections on the structures that surround us, like the facade of a building for instance. Speech bubbles are projected on walls near windows and doors to encourage an audience to create the conversations happening inside. ...The whole system is automatic and uncensored. The piece explores the use of mobile technology to trigger dialogue, action and create content for a staged public performance. By using the facade of a building the intention is to

⁴ The list and much of the descriptive text accompanying the cases in this section is written by Bo Stjerne Thomsen and is located at the web site: <http://performative.wordpress.com/>. In cases where the descriptive text is from another source this is explicitly shown. All projects need to be seen at these web sites to properly develop an impression of their nature and their visual qualities. Here the list is merely a descriptive tool.

engage an audience to think about the physical spaces we move through, live in and share' (<http://www.txtualhealing.com/>)

Open Burble: 'With the Open Burble a large number of connected balloons are launched to the sky with each balloon equipped with LED light and connected to an electronic system. The design of the colour patterns and interactions are carried out together with the citizens assembling the modular system to one collective whole. When the total construction is launched it can be positioned and the light adjusted according to the participants movements on ground where the individual actions are initiating echoes of light through the overall Burble. The main performative experiences occurs when each individual action becomes an integral part of the overall spectacular experience' (<http://performative.wordpress.com/>)

Blinkenlights (Berlin/Paris): 'During the event where the interactive installation occupied the facades, the building was turned into an Arcade game where it was possible to play the classic computer games on one of the towers of the National Library. At the same time the interactive software was extended to include public participation where people could create own animations and pictures to upload to the façade as well as doing experiments in sending individual messages to the urban screen from mobile phones. In this way the building became an urban media for both events and social groupings around the city' (<http://performative.wordpress.com/>)

D-Tower: 'The tower changes the lights according to emotions reflected from the D-tower website. On the website there is a questionnaire, where the inhabitants can respond to respectively love, hate, happiness and fear, determining the intensities of their feelings. Each evening the tower transmits the colours as "the State of the Town" assuming the most intensely emotions as a large interactive system of relationships' (<http://performative.wordpress.com/>)

Tunnel of Lights (Oslo): 'The Metro Station, Nydalen, in Oslo, contains an interactive installation located in the tunnel at the 30 sec. ride with the escalators connecting the ground level and trains. The metro station is designed by architect Kristin Jarmund, and the Intravision System developed the interactive installations. The sound and light system consisting of 1600 CCL light tubes and 44 loudspeakers variate the light and sound patterns depending on the flow of people to and from the trains creating a 30 sec break from the daily routine' (<http://performative.wordpress.com/>)

Cell Phone Disco: 'Cell Phone Disco is a surface that visualizes the electromagnetic field of an active mobile phone. Several thousand lights illuminate when you make or receive a phone call in the vicinity of the installation. Cell Phone Disco makes an invisible property of the environment perceptible to our senses. It reveals the communicating body of the mobile phone' (<http://www.cellphonedisco.org/>)

Obviously this list is far from comprehensive enough to capture those many experiments taking places in contemporary cities across the world. However, here we wanted to use them as global reference points for identifying elements of PUE. Needless to say they are not all fully fledged examples of PUE but they carry ideas and technologies that touch upon the key rationales of PUE.

Coming from those global examples we now move towards two specific cases much closer to the field of this author's institutional affiliation.

6. NoRA⁵

In the first case, we will look into how the interactive pavilion 'NoRA' (Northern Research Application) build by Architecture and Design students and exhibited at the 2006 Architecture Biennale of Venice and since in Skagen and Aalborg, Denmark (Jensen & Thomsen 2006). NoRA constitutes a performative environment of mediated interaction (see figure 4 and <http://www.aod.aau.dk/staff/bsth/nora/>). On the Biennale in Venice an area of about 35 m² was occupied mainly as an exhibition space and with the integrated technologies activated as local generator and attractor. NoRA addresses the issues about global connection through 5 online cameras that always are able to track the local site accessed through a webpage. The architecture of NoRA becomes the eye to the local society as it mediates the local and the global by switching the fixity and flows.



Figure 4: NoRA and the 'satelites' transmitting flows to the pavilion (Photo: Bo Stjerne Thomsen)

The technologies of NoRA track the movement of people in the surrounding environment through infrared cameras and filter the local movements of people into sound and light. The changes in

⁵ The section on NoRA and the following on MAUTS are taken from the paper Jensen, O. B. (2008a) *Neworked mobilities and new sites of mediated interaction*, in K. Terzidis (ed.) (2008) *What Matter(s)? First International Conference on Critical Digital*, conference proceedings, Boston: Harvard Graduate School of Design, pp. 279-285. The actual NoRA project was made by the NoRA Project Team: Architecture and Digital Design, 8th Semester, Architecture & Design, Aalborg University, 2006.

movements around the building are furthermore attached to three satellite units at each corner of the building each initiating sound scapes from the local surroundings. The light colours on the building are determined by the surrounding movements and coherent with the changing sound pattern. Thus NoRA is a reactive space always acting towards a changing context both according to changing light and sound from movements as well as the main soundtrack slowly adapted from location. Through the sensor technology and the interaction with the building the visitors enter a feedback loop with the urban setting establishing a temporary urban environment from the flow of local actors and maintained through live recordings. What happens with NoRA is that people engage in mediated interaction as they flow through the pavilion space. As such NoRA is here interpreted as a 'working principle' for a new type of urban transit space design, mediated by technology and challenging the mono-functional interpretation of such sites. Thinking about performative urban environments that encourage people to interact mediated by the pavilion opens a new set of design issues for transit spaces. NoRA was a window into exploring different dimensions to networked mobilities and mediated interaction that leads to the following issues for critical discussion and future research:

- The making of prototypes for new interactive urban artefacts and sites of interaction facilitating new public domains
- Exploring the potentials in building new mobile, plural and open platforms for social interaction mediated by technological artefacts and urban architecture
- Explore the potential for transgressing the commercialized mediascapes of urban architecture that we know in the guise of urban ads and electronic facades communicating the gospel of consumption

7. Mobile Agents in Urban Transit Spaces (MAUTS)

In the second case, MAUTS (an acronym for 'Mobile Agents in Urban Transit Spaces') we explore the meaning of mobile robots in transit spaces from the point of view of asking if such new mobile technologies can increase the mediated interaction and thus potentially challenge the mono-functional understanding of transit spaces as mere waiting spaces. The MAUTS project has opposed to NoRA not been fully implemented and in this paper we shall only be able to reflect upon a pilot test made in December 2007 in the transit space of Kennedy Arkaden, Aalborg, Denmark (see Svenstrup et al 2008 for a fuller account for the experiment). The project takes point of departure in an awareness of increasing global transportation activity and congestion has increased the time we spend in transit. Whether it is waiting in line for security checks in airports or delays due to train service interruption, most perceive transit time as unproductive, boring, but unfortunately unavoidable in contemporary urban environments. The project is set to explore if there is a potential for adding both economic value and experiences to the transit time by thinking differently about transit. Adding mobility and manipulation capacities in terms of mobile agents (robots) to urban transit spaces and allowing them to interact with humans will create new interesting spaces that are productive, educational, safe and potentially enjoyable. It is explored if urban transit spaces endowed with mobile agents may enhance traditional service functions such as guidance and provide information about the functional properties of the environment. Value may also be added by providing an experience that for example makes waiting in the line for security check enlightening. Mobile agents may provide the waiting person with educating information about destinations to be reached or even interact with the waiting person in playful and unforeseeable manner. While doing so, they may advertise services and products, or track, monitor and survey persons thereby providing mobile security information for e.g. airport spaces. The project develops

methods and technologies for the construction of cognitive mobile agents for transit spaces, able to evolve and grow their capacities in close interaction with humans in an open-ended fashion.



Figure 5: *Santabot* in interaction, Kennedy Arkaden (image from pilot study video)

A pilot test was made in December 2007 in the transit space of Kennedy Arkaden, Aalborg, Denmark. In this experiment we let a mobile robot dressed in Santa Claus costume (due to the fact that the experiment took place in a public shopping arcade in December and thus nicknamed 'santabot' by the research team) track and interact with people (see figure 5). Tracking was the main issue here as there is a number of difficulties in getting the robot to follow and approach people in a non-intimidating fashion. Speaking of 'interaction' hereafter is perhaps too much as Santabot is the 'dumb' first generation mobile agent in a transit space (only capable of tracing and movement). Thus one might surmise that the second generation MAUTS could be over-layered with one-way information technologies (e.g. traffic information). A third generation MAUTS could be added interactive technologies (e.g. games and interactive communication) and thus become the '*digital co-passenger*' of the future. According to the interviews made with people after the interaction with the robot these options clearly seemed imaginable.

From the initial stage of this project we find the following issues of relevance to a critical exploration into networked mobilities and new sites of mediated interaction:

- Explore the meaning of transit spaces and contemporary urban mobility by using mobile agents
- Challenge the understanding of transit spaces as generic and uninspiring per se, but also address the issue of power (e.g. surveillance potentials related to mobile agents)
- Exploring the notion of 'mobility as culture' and that places orchestrating mobility therefore should be understood in the light of their potential for generating meaningful experiences, social interaction and public domains

8. Discussion and concluding remarks

The NoRA and MAUTS cases are windows into a discussion of the risks and opportunities offered by mediated interaction. In particular these issues are important when addressing the contemporary situation of urban mobility. Surely they are too superficial to show all relevant issues at hand. However, they are examples of the sort of interventionist experiments that needs to be conducted in order to uncover the meaning of mediated mobility. We need to ask what would happen to our understanding of urban mobility if we explored the empowering potentials of performative urban spaces (NoRA) and mobile agents (MAUTS)? But equally, where are the dangers of such technologies and mediated environments creating social control and exclusion?

We want to end this paper with a pledge for critical research into the new mediated sites of interaction and suggest a number of important research issues to follow up on:

- Engage with the ambivalences of networked mobilities and mediated projects (i.e. focus both on the potential for enrichment of experiences as well as the questions of social exclusion)
- Critically challenge of taken for granted interpretations of networked mobilities (i.e. that mobility is an instrumental act of moving from A to B and therefore all transit spaces are instrumental and generic)
- Explore new theoretical concepts in order to move beyond dichotomies of local/global, virtual/physical, space/place, sedentary/nomad
- Discuss the division between utopian and dystopian perspectives (arguing for a 'utopian realism'), asking how digital technologies may empower mobile social agents?
- Explore prototypes for interactive urban artefacts and sites of interaction facilitating new public domains
- Explore the potential for transgressing the commercialized mediascapes of urban architecture
- Critically discuss if we can move beyond commercial exploitation and state control, and whether mediated interaction spaces become even more meaningful and culturally enriching if we enhance the technological networks of such spaces?

Arguable the mobility spaces of everyday life are potentially productive sites of interaction. Moreover we would claim that new knowledge about the meaning of mobility and the design potentials may enhance the experience within transit spaces beyond 'waste of time'. Needless to say we need also to analyse these developments critically. In general terms there is a new research agenda for the phenomenon of performative urban environments starting to emerge. This is an agenda that should focus on exploring place-making with new socio-technical systems by experimenting with prototypes for interactive urban artefacts. It should focus on an investigation into how digital technologies may empower mobile social agents as embodied experiences. The agenda would orient itself towards the exploration of how new interactive technologies shape our social relationships, environments and culture with local protocols, and research into how mobile technologies affects the perception of space and participate in shaping the material sites of interaction.

The experiments with PUE point at more 'progressive' and political agendas as well. Here we would argue that it should be possible to unfold a 'politics of visibility' by using PUE as learning events for the public to see the potential and risks related to technologies. This means that PUE

invites us to think carefully about urban learning sites, city experiments, the cultural importance of fun and play beyond the commercial industries, utopian reflections, and ultimately the issue of the 'right to the city'. In this we must insist on balancing the interest in exploring technologies and their potential 'on their own terms' so to say with a careful interest in power and social issues. We need to confront hard questions such as if PUE is socially inclusive or not? We need to engage the issue of the 'ambivalence of technology' (i.e. emancipation and domination) and explore whether these can move beyond commercial exploitation and state control? We will end this paper by referring to Ingersoll's analysis and discussion of infrastructures and their potential in becoming more than instrumental artefacts:

'Transportation infrastructures continue to be designed with the positivist ethos of government institutions and thus elicit a certain inevitable determinism that corresponds to the economics of increased mobility. Despite their potential consensus: these interventions are often upsetting and alienating ... citizens and designers could demand more of infrastructure than just its primary functions ... Infrastructure as utilitarian responses to the pressing problems of mobility invariably cause environmental and social problems. To approach infrastructure as art can provide a way of dealing with the violence it interjects into the urban system and become a means of creating civic meaning' (Ingersoll 2006:123-124)

The crucial question therefore is; can performative urban environments create 'civic meaning' and thus perform in a socially progressive manner? This is the real important issue when exploring networked mobilities and performative urban environments.

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