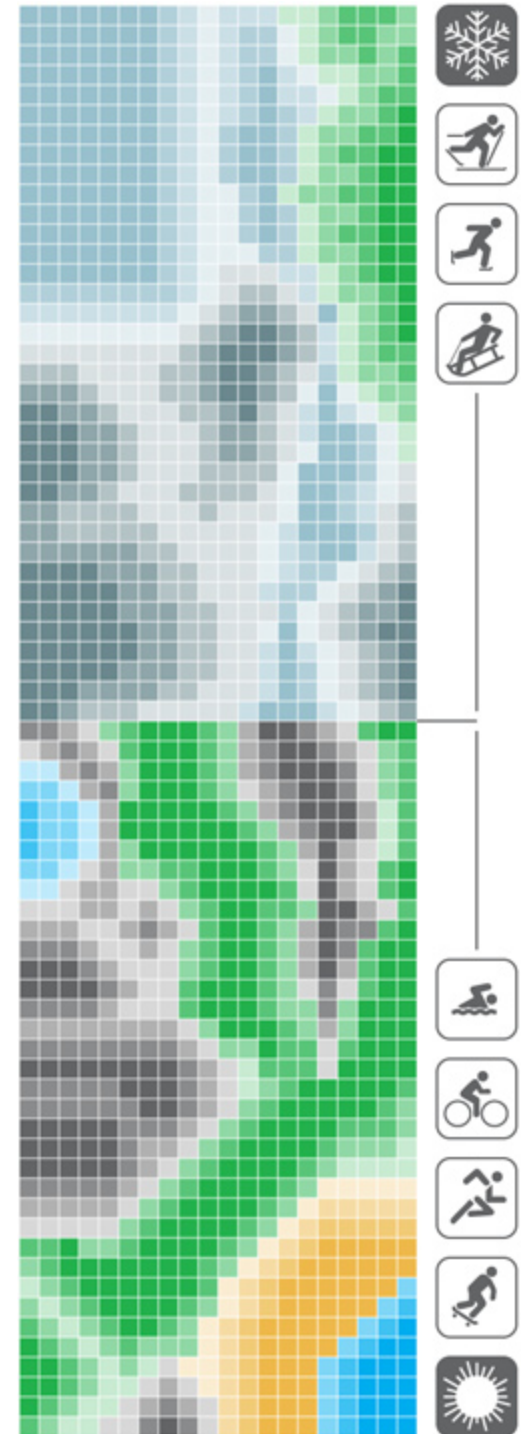# PUBLIC SPACE FOR AMBIENT INTELLIGENCE

Arch 684: Competitions Essay Component

Submitted by Ryan Ollson

April 2007

Competition Theme

"What new kinds of public space exist in a society sustained by ambient intelligence (ubiquitous computing)? Public spaces are places for communication between people and things. What public spaces appear when new communications have arisen in a society that has developed ubiquitous computing technology (ambient intelligence)? We are calling for proposals for these immanent new spaces."▶1

VS.

Problem Statement

"The works of the past always influence us, whether or not we care to admit it, or to structure an understanding of how that influence occurs. The past is not just that which we know, it is that which we use, in a variety of ways, in the making of new work…. The typology argument today asserts that despite the diversity of our culture there are still roots of this kind which allow us to speak of the idea of a library, a museum, a city hall or a house. The continuity of these ideas of type, such as they are, and the esteemed examples which have established their identity and assured their continued cultural resonance, constitute an established line of inquiry in which new work may be effectively grounded."▶2

There is an inherent contradiction present in contrasting an emerging computing technology which has the ability to alter how we, as social beings, communicate on a daily basis with the idea of typology and precedent in architecture as that which grounds us culturally, allowing us to develop new works. However, contradiction and conflict are vital components in allowing new knowledge and alternative solutions to emerge. The following research paper and competition proposal is rooted in this contradiction and attempts to draw valuable conclusions from it.

▶1 Discussion: Tokuda, Hideyuki, Kuma, Kengo, Aoki, Jun & Nishizawa, Ryue. *What does "ubiquitous" mean? – Public space altered by new types of communication*. NTT DoCoMo, Inc. Mobile Society Research Institute, 2006.

▶2 The Harvard Architectural Review. Volume 5. *Precedent and Invention*. Between History and Tradition: Notes Toward a Theory of Precedent. John E. Hancock.

Introduction

"Long ago, there was a desert village with a well at its center. The houses clustered within the distance that a jar of water could comfortably be carried. In the cool of the evening the people came to the well to collect the next day's supply of water, and they lingered there to exchange gossip and conduct business with one another. The well supplied a scarce and necessary resource, and in doing so also became the social center-the gathering place that held the community together.

Then the piped water supply came. Who could deny the practical advantages? It was more convenient, and kids no longer got cholera. Population grew, and the village expanded into a large town, since houses could be supplied with water wherever the pipes could run.

Dwellings no longer had to concentrate themselves in the old center. And the people ceased to gather at the well, since they could get water anytime, anyplace. So the space around the wellhead lost its ancient communal function, and the people invented some new, more up-to-date and specialized sites for socializing-a piazza, a market, and a café.

History replays – this time because the information supply system has changed. Once, we had to go to places to do things; we went to work, we went home, we went to the theatre, we went to conferences, we went to the local bar – and sometimes we just went out. Now we have pipes for bits – high-capacity digital networks to deliver information whenever and wherever we want it. These allow us to do many things without going anywhere. So the old gathering places no longer attract us. Organizations fragment and disperse. Urban centers cannot hold. Public life seems to be slipping away." ▶3

William Mitchell in this excerpt from *Etopia: "Urban life, Jim – but not as we know it"* communicates a strong rhetoric of loss, a nostalgic view of the city and its functioning social networks. What once was is no longer, but why? Multiple occurrences have led to this social and spatial fragmentation of the city, including de-industrialization, suburbanization and disinvestment, but one often left unconsidered in the realm of

▶3 Mitchell, William John. *E-topia: "Urban life, Jim-but not as we know it"*. Cambridge: The MIT Press. 1999. Pviii

architecture is emerging computing technologies. In an age driven by technological advancement, emerging technologies are often developed and promoted with naïve optimism towards revolutionary social changes.

> *"The problem with these visions is that they are, for the most part, technologically deterministic. Technologies are supposed to impact directly on society by causing social change (for the better). They only look at what is technologically feasible and ignore the socio-economic context and user dynamics that are shaping the innovation process as well."* ▶4

This problem reveals a crisis in our current methods for developing new technologies, one that is void of a past reference and blindly focused on developing new technologies to be considered revolutionary or "state of the art". Focusing on this crisis of technological development and its impact on our urban centers, this research paper seeks to address the following question:

In an age of increasingly non-physical communication, what can we draw from the past that will allow us to better understand, develop and advance emerging technologies for the future?

The first section will address the phenomenon of ubiquitous computing, its origins and its possibilities. The second section will address the current physical and social fragmentation that plagues our public realm. These two seemingly unrelated conditions, in combination with project precedents, will then merge to form the *Public Space for Ambient Intelligence* competition entry resulting in an innovative proposal for our cities of the future.

▶4 Ed. Silverstone Roger. Media, Technology and Everyday Life in Europe: From Information to Communication. Aldershot: Ashgate Publishing Limited. 2005. P163

Defining Ubiquitous Computing

Ubiquitous computing, also known as *ambient intelligence*, signifies the third wave in computing technology. In order to comprehend this new wave of computing we must first gain an understanding of the shifts in computing technology which allowed us to arrive at this point.

> *"The first is whereby computing systems move from mainframe computing (1960 onwards) to personal computing (1980 onwards), and from multiple computing devices (2000 onwards) towards invisible computing (2010 onwards). The second is the expectation that communication processes will change, from people talking to people, to people interacting with machines, to machines/devices/software agents talking to each other and to people. A third important shift is the one which presumes that interfacing with computing capabilities will become natural and intuitive, in contrast with current Graphical User Interfaces (GUI)."* ►5

In short, ubiquitous computing intends to transform the role of information and communication technologies in society, altering the way we live, work and play.

Mark Weiser, creator of ubiquitous computing, began his quest from a common critique of computing technology as it existed in the second wave. The critique was that "the most profound technologies are those that become embedded in people's lives; current computers force people to separate their machine life from the rest of their lives, so computers in their current form would never become a very significant or profound technology." ►6 Weiser decided to take this critique as a challenge to develop a computing technology that could participate more deeply in our physical environment, and hence was born the idea for ubiquitous computing. Ubiquitous computing technologies recede into the background of our lives where we as humans "interact no longer with one computer at a time, but rather with a dynamic set of small networked computers, often invisible and embodied in everyday objects in the environment," ►7 the point being to achieve the most effective kind of technology, one that is essentially invisible to the user.
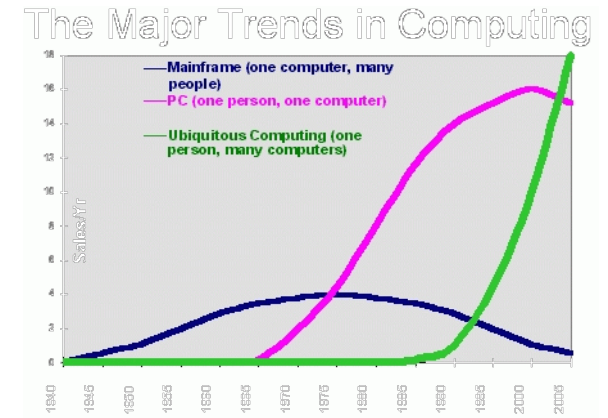

Figure 1 - Major Trends in Computing

►5 Ibid. P159

►6 Mark Weiser. *"The Technologist's Responsibilities and Social Change."*. Computer-Mediated Communication Magazine, V2N4. April 1, 1995.

►7 http://www.ubicomp2007.org/

Another phenomenon often confused with ubiquitous computing is virtual reality, but in fact it is almost the opposite. Virtual reality removes people from reality by placing them in an imagined computer-generated world where ubiquitous computing attempts to integrate the computer into the world we live in, addressing multiple disciplines such as computer science, engineering and social sciences.►8 [Fig. 2] "VR, by taking the gluttonous approach to user interface design, continues to put the interface at the center of attention, leaving the real world behind."►9

Metaphors are powerful mechanisms to communicate a concept by likening it to something else in order for us to gain a better and quicker understanding of it. Weiser uses the metaphor of childhood to remind us of the value of invisibility: "playful, a building of foundations, constant learning, a bit mysterious and quickly forgotten by adults. Our computers should be like our childhood: an invisible foundation that is quickly forgotten but always with us, and effortlessly used throughout our lives."►10

Social Implications of Ubiquitous Computing

It is a much more efficient process to develop new technology around the communication and knowledge of its potential social implications than to blindly develop it without being aware of them and hence leaving it vulnerable to exploitation. As de Certeau claims in *The Practice of Everyday Life*,

> *"The presence and circulation of a representation tells us nothing about what it is for its users. We must first analyze its manipulation by users who are not its makers. Only then can we gauge the difference or similarity between the production of the image and the secondary production hidden in the process of its utilization."►11*

When the design and implementation process is void of this relationship, it becomes vulnerable to being used in dangerous manners previously unconsidered, resulting in unforeseen consequences of its intended use. This is an important point about any emerging theory or technology, that it must be communicated and understood as a whole before it can be accepted or rejected as a possibility.
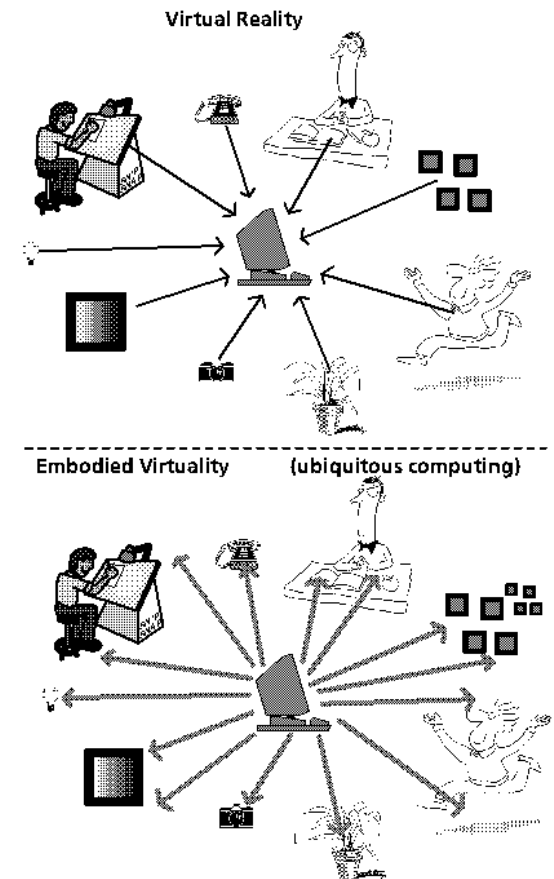

Figure 2 - Virtual Reality vs. Ubiquitous Computing

►8 http://sandbox.xerox.com/ubicomp/

►9 Interactions, January 1994. *"The World is not a desktop"*. Mark Weiser

►10 Ibid.

►11 de Certeau. *The Practice of Everyday Life*. Berkeley: University of California Press, 1984. Pvii

"Before long, comments in the press and from our colleagues indicated that we were doing something dangerous: a technology that could be used for the tracking and control of people. What if Nazi Germany had this? But we also believed that we were creating a technology with significant potential for good…What to do? "►12

When one can observe the potential for negative applications, what is the correct way to respond? Most people would agree that abandoning the process is the proper response as it completely eliminates the possibility of harm. However, instead those at PARC (Palo Alto Research Center) decided to continue with the process by adding a new component that others had not yet considered.

"Well, at PARC we have philosophers, social scientists, and anthropologists to offset the engineers; perhaps we could proceed with the work while maintaining a dialogue about its uses. This would at least be an improvement over the naive optimism of a pure engineering lab."►13

The result of this multi-disciplinary dialogue, a concept all too often neglected in the design world, was a two principle "guide to action" for Ubiquitous Computing research called "Weiser's Principles of Inventing Socially Dangerous Technology."►14 They are as follows:

1. *Build it as safe as you can, and build into it all the safeguards to personal values that you can imagine.*
2. *Tell the world at large that you are doing something dangerous.*

The first principle adopts a more enlightened process by ensuring that it is possible to develop a system or technology with the appropriate safeguards. The second principle provides a platform for discussion and communication by anyone and everyone, from which new concerns may emerge and be addressed. Most people, when faced with criticism, tend to defend their work as strongly as possible, however, this mentality contains dangerous consequences as the designer is blind to the implications of their work. Therefore, it is the responsibility of the designer in this case, and in

►12 Mark Weiser. *"The Technologist's Responsibilities and Social Change."* Computer-Mediated Communication Magazine, V2N4. April 1, 1995.

►13 Ibid.

►14 Ibid.

any case for that matter, to "pro-actively begin debate about how the technology should be used,"►15 resulting in a better understanding of the technology for the designer themselves as well as for the potential users. This will ensure that the purpose of the embedded safeguards is understood and therefore, will not be removed. As Weiser states:

> *"No set of principles can take the place of engaging in discussion -- pulling, pushing, and throwing one's weight into composing the life and culture we lead and will lead in the future...The main discussion is the one that happens day to day among all the individuals of our culture as they choose to go along or dissent."►16*

►15 Ibid.

►16 Ibid.

The Urban Public Realm

"Public spaces are – or at least should be – places where individuals and the community can, openly, and insecurely, meet. The functional units, the highly structured, programmed, and controlled spaces in the contemporary city, mean to threaten the city's crucial characteristics, namely openness and unpredictability." ►17

The affects of de-urbanizing processes and the general decline of urban areas extend beyond the physical realm of the city, permeating the social realm as well. In decline, the relations between the public space and everyday life of a city begin to malfunction, portraying images of fear and insecurity, threatening local urban identity. Aside from the physical spaces of bars, cafés and squares, urban public life must also be supported by "forms of interaction that are open to noncommittal chance encounters with the other people and by ready contact to the new; that must, in the end, be embedded in civic values such as curiosity about the rest of the world and pride in one's own."►18 If the public realm is lacking such urban diversity, discouraged residents are unable to identify with their city's urban environment and tend to retreat into the comforts of their home. In this sense, "both demolition and rebuilding projects give rise to questions about the compatibility of the (dis)continuity of the built environment and the (dis)continuity of people's biographies." ►19

Another contributor to the malaise of urban public life is our continuous obsession with the shopping mall. Founded on the concept of designing an internalized city rather than retail space, the mall has done well to disrupt the former heterogeneity offered by our city centers and reduce the experience of the individual to the single act of consumption.►20 Intentionally sheltered from the possible dangers that lurk in the city, shopping is quickly becoming our only remaining public activity. However, as Greg Pasquarelli addresses in a roundtable discussion during The Good Life exhibition at the Van Allen Institute, it is not necessarily the act of shopping that attracts people to the mall, rather, it is "a word they equate with activity or texture versus something that is harder to define, such as delight in a space, or things that interest you or activate the mind."►21 As a result of this controlled consumer experience, the

►17 Cupers, Kenny & Miessen, Markus. *Spaces of Uncertainty*. Wuppertal: Verlag Muller + Busmann. 2002. P12

►18 Oswalt, Phillip, ed. *Shrinking Cities Volume 2: Interventions*. Hatje Cantz Verlag: Ostfildern, Germany, 2006. P676

►19 Ibid. P676

►20 Cupers, Kenny & Miessen, Markus. *Spaces of Uncertainty*. Verlag Muller + Busmann, Wuppertal, 2002. P14

►21 Ryan, Zoe. *The Good Life: new public spaces for recreation*. New York: Van Alen Institute. 2006. P37

city becomes progressively more and more fragmented into homogeneous zones of public consumption that offer a very limited social experience. In this sense, our understanding of public space gets distorted and exists as "a waiting room for urban addicts, where the active players have vanished."►22

The threatened urban public life and identity created by de-urbanizing processes and our continual transformation into homogeneous consumers adds further urgency to the regeneration of a public realm that promotes and sustains urban diversity: "even if a postmodern understanding of public life does not depend necessarily on a central town square, the symbolic value of the town center as a crystallization point of civic identity should not be underestimated."►23

Precedents

Conventionally a park is "a replica of nature serviced by a minimal number of facilities that ensure its enjoyment; the program of Parc de la Villette extends like a dense forest of social instruments across the site."►24 During the life of a park, program undergoes constant change and adjustment, responding to the multiple temporalities that inhabit it. The Parc de la Villette proposal responds to this by using a "method that combines architectural specificity with programmatic indeterminacy."►25 The scheme, instead of being a detailed design of a park, becomes a tactical proposal that provides a relatively stable aesthetic experience but offers maximum benefit from implanting the multiple activities on the site in the most efficient and dynamic manner. This was achieved through a set of projections, that when superimposed on the site allows the coexistence of multiple activities and their mutual interference to form new unprecedented events, or social condensers. This programmatic indeterminacy "allows any shift, modification, replacement, or substitution to occur without damaging the initial hypothesis."►26 The four projections are as follows►27:

1. The Strips
Subdivided into a series of parallel bands, the strips accommodate the major programmatic categories: playgrounds, gardens, etc, avoiding any concentration or clustering of the programmatic components. Maximizing the length of the 'borders'
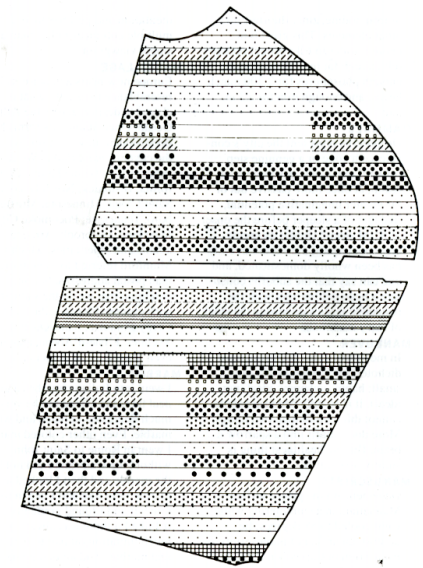

Figure 3 - The Strips

►22 Cupers, Kenny & Miessen, Markus. *Spaces of Uncertainty*. Verlag Muller + Busmann, Wuppertal, 2002. P17

►23 Oswalt, Phillip, ed. *Shrinking Cities Volume 2: Interventions*. Hatje Cantz Verlag: Ostfildern, Germany, 2006. P680

►24 Koolhaas, Rem & Mau, Bruce. *Small, Medium, Large, Extra-Large*. New York, NY: The Monacelli Press, 1995. P921

►25 Ibid. P921

►26 Ibid. P921

►27 Ibid. P927-34

between the programmatic components ensures maximum permeability and maximum programmatic mutations. The arrangement is similar to the experience of a high rise building with different programmatic events on each floor, the difference being that the summation is more than the accumulation of its parts.

2. Point, Grids, or Confetti

Added to the strip treatment are small-scale elements (kiosks, playgrounds, refreshment bars, picnic areas, etc) occurring across the site with a calculated frequency. These elements will acquire and influence the character of their "host" strip creating multiple experiences of the same base element. Spread across the entire site, they also serve as recognizable elements giving a sense of place to the park as a whole.

3. Access and Circulation

The access and circulation system consists of two major elements: the Boulevard and the Promenade, which exploit all episodes and reap the benefits of the programmatic arrangement and distribution described above. The Boulevard accommodates the 24-hour part of the program, attracting continuous public life along its perimeter.

4. The Final Layer

The final layer consists of the major elements such as the sphere of the Science Museum, the Ariane, the Rotonde des Veterinaires, etc. These elements are connected by the established network of spaces as described above.

Although non-related to ubiquitous computing technologies, OMA's Parc de la Villette proposal provides an example of an urban public space that acts as a "framework capable of absorbing an endless series of further meanings, extensions, or intentions, without entailing compromises, redundancies or contradictions." ►28

Where OMA used the organization of multiple programmatic elements to generate social condensers in the Parc de la Villette proposal, Gorbet Design focus on the use of technology as the instigator of public interaction. Their mission "is to enhance people's experience of public spaces through the creative application of technology." ►29 Through innovative interaction techniques, their work adds surprise and
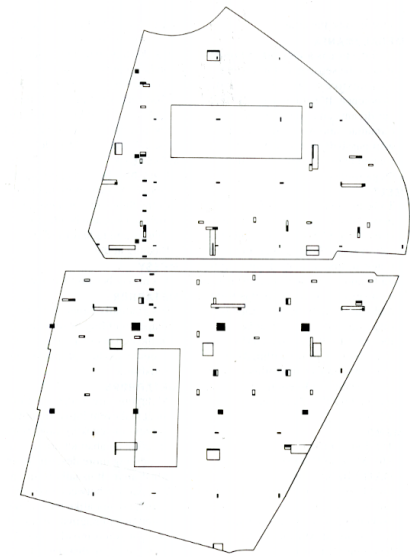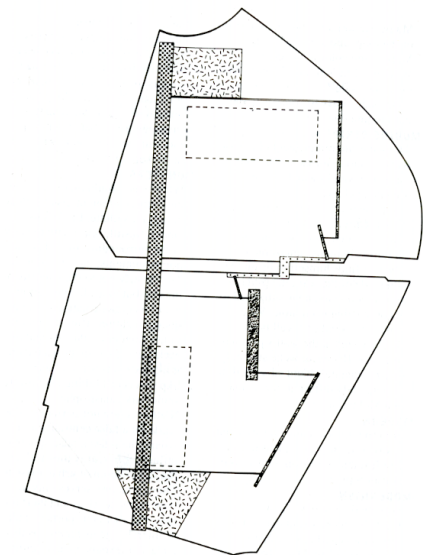

Figure 4 - Points, Grids, or Confetti

Figure 5 - Access and Circulation

►28 Ibid. P934

►29 www.gorbetdesign.com

delight to such everyday spaces as retail design stores, hotels, museums and public squares. With backgrounds in psychology, computer science and architecture, their work is crosses multiple experiences in order to create dynamic public spaces that offer new and unexpected urban experiences.

Their most well-known work to date includes an installation for Herman Miller RED which provides a link between their virtual store and their new physical store. The installation projects graphics created by the online consumer activity on their website, displaying ambient information to those working in the physical space, allowing them to constantly aware of the online activity in a subtle manner.▶30

A local installation, performed at Kitchener City Hall, P2P (Power to the People) highlights the ubiquity of one of the most basic symbols of the electric age: the household light switch and light bulb. Situated in the most public forum of the city, the project "puts the marquee, a now-ubiquitous and iconic tool of corporate communication, into the hands of the general public."▶31 Engaging the everyday activity of flipping a light switch, the public is empowered with the self-regulated ability to communicate within a government owned public space. This interaction and collaboration brought together all segments of the community, "acting as a catalyst for discussion about the limits of free speech in civil society"▶32 and incubating social interaction between differing and, at times, opposing social cultures.

In order for a space to become a place it needs a catalyst from which the social interaction can emerge. The preceding projects illustrate this concept of the catalyst through two different forms: OMA uses the calculated dispersal and intended hybridization of program in the Parc de la Villette proposal, while Gorbet Design, in the P2P project, uses the ubiquitous act of turning on and off a light switch. These precedent projects serve as reference for the competition design proposal which follows.
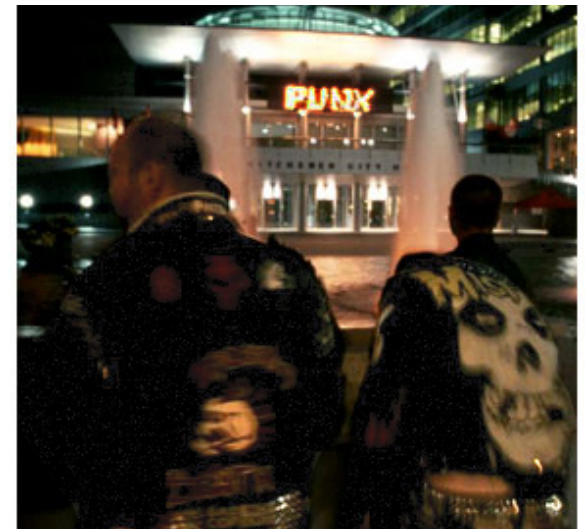

Figure 6 - Herman Miller RED

Figure 7 - P2P

▶30 Ibid.

▶31 www.gorbet.com/p2p/

▶32 Ibid.

The Competition Entry - Compliant Space

The competition entry is rooted in the convergence of the socio-spatial fragmentation of our urban public realm and the emerging socially conscious technology of ubiquitous computing. The result is a networked landscape grid which responds to its users demands, through their communication with the embedded technology. This user-space communication has multiple benefits. First of all, the space has no pre-conceived notions of what specific activity is to take place within it, allowing it to adapt to multiple programmatic requests and allowing the user to define their desired use. This customizing of space provides the user with a new level of comfort in their surrounding environment. Secondly, as multiple users gather within the space, clusters of activity begin to form and the space itself, through communication with its users, acts as a social condenser, the initiator of physical and social interaction. The hybridizing of multiple programs upon the initially vacant terrain encourages a dynamic co-existence of activities, generating new events and social interaction between different public social groups, cultures, life styles and mentalities.

Configurations:

The multiple configurations are the result of different activities occurring at different hours of the day. The four illustrated configurations are as follows:

9AM [Fig. 1]
A predominantly transient time for most inhabitants of the city, the terrain maintains a level topography to maximize the ease of transition from home to work or for those out for their morning walk or jog.

3PM [Fig. 2]
A more active time of the day, youth are engaged in recreational activities of all kinds. The terrain responds accordingly, developing clusters of skateboards, soccer players, swimmers, etc, encouraging their collective social interaction.

9PM [Fig. 3]
Predominantly engaged in leisure activities, the terrain returns to a fairly level topog-
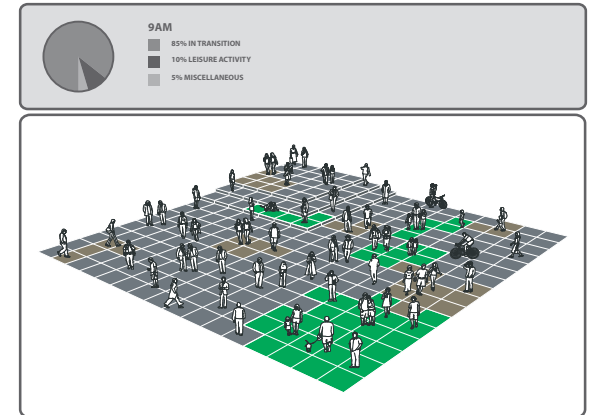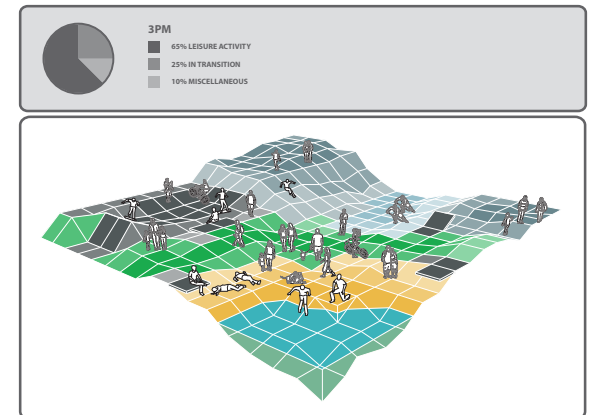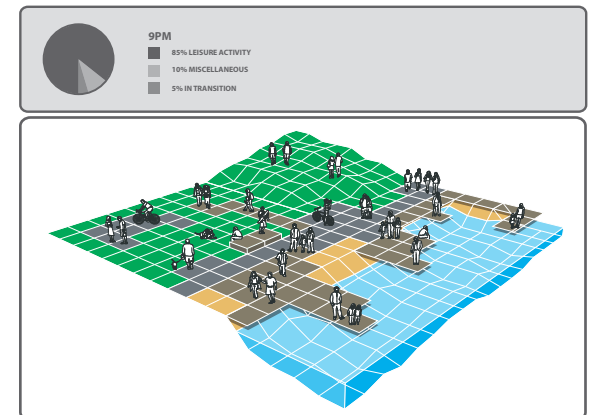

Figure 8 - 9AM

Figure 9 - 3PM

Figure 10 - 9PM

raphy. Users engage in their nightly-walks, jogs, roller-blades, etc, and gather before returning to the privacy of their own homes.

SPECIAL EVENT [Fig. 4]
Programmed specifically for a single event, the park becomes community gathering place for entertainment such as concerts and festivals. Conforming to the intended program, the space enhances each experience as it intelligently understands its user's demands and desires.

The project allows for any number of configurations to emerge as the space conforms to multiple programs at any given time. "Instead of treating 'park' as the opposite of the city – a programmatic non-entity, this approach demonstrates that the park can sustain program with superior ease,"▶33 especially through the incorporation of emerging ubiquitous computing technologies.

Figure 11 - SPECIAL EVENT

Conclusion

As stated in the introductory paragraph, this research proposal set out to address the following question:

In an age of increasingly non-physical communication, what can we draw from the past that will allow us to better understand, develop and advance emerging technologies for the future?

Integral to any conscious design process is the consideration of its social and cultural implications, a component often lacking in the development of new technologies. Raising the consciousness of the design process, through an understanding of our daily functions, something that can only be referenced from the past, allows the new technology to become seamlessly embedded in everyday life. The result is a more efficient and inclusive design process that is aware of its possible implications and more prepared to be released into and embraced by society.
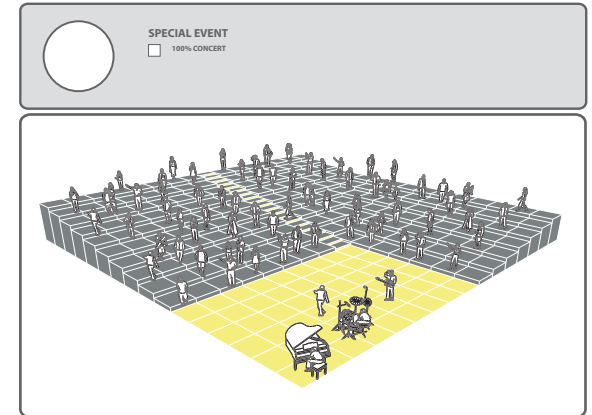
▶33 McGetrick, Brendam & Koolhaas, Rem, eds. *Content*. Paris: Taschen, 2004. P74

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Xerox Palo Alto Research Center – Sandbox Server
http://www.ubiq.com

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Figure 2 - Virtual Reality vs. Ubiquitous Computing - http://www.ubiq.com/hypertext/weiser/VRvsUbi.gif

Figure 3 - The Strips - Koolhaas, Rem & Mau, Bruce. Small, Medium, Large, Extra-Large. New York, NY: The Monacelli Press, 1995. P923

Figure 4 - Points, Grids, or Confetti - Ibid. P925

Figure 5 - Access and Circulation - Ibid. P927

Figure 6 - Herman Miller RED - www.gorbetdesign.com

Figure 7 - P2P - Ibid.

Figure 8 - 9AM - Compliant Space: Public Spcae for Ambient Intelligence Competition Entry - Bowman, Kate & Ollson, Ryan

Figure 9 - 3PM - Ibid

Figure 10 - 9PM - Ibid

Figure 11 - Special Event - Ibid