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Rethinking space + place : negotiating a social realm between mobile technology and architecture

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RETHINKING SPACE + PLACE
NEGOTIATING A SOCIAL REALM BETWEEN MOBILE TECHNOLOGY AND ARCHITECTURE

by
Thomas Chan
B.Arch.Sci., Ryerson University, Toronto, 2006

A design thesis|project
presented to Ryerson University

in partial fulfillment of the
requirement for the degree of
Master of Architecture
in the Program of
Architecture

Toronto, Ontario, Canada, 2010
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ABSTRACT

RETHINKING SPACE + PLACE

Neogotiating a social realm between mobile technology and architecture

M.Arch 2010 Master of Architecture

Thomas Chan Ryerson University

The thesis examines the relationship between mobile technology and architecture, and argues that architecture can better address the proliferation of mobile and communication technology through its social and perceptual implications. The thesis examines changing social conditions and spatial perception, through an investigation of our sense of space and place, and confirms the need to revisit the role of architecture in the physical public realm. Through observation and analysis in the underground PATH network in Toronto, the thesis tests these social and perceptual implications against real experiences, and establishes a role in which architecture can take part in rethinking space in the public realm. Through the design of a prototypical environment in Nathan Phillips Square, the thesis demonstrates that architecture, negotiating between direct, mediated, and virtual experiences, is capable of generating an augmented environment that enhances social engagement and encounters, making public space into places of public social encounters.

ACKNOWLEDGEMENTS

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Finally, I thank my parents for my education, and putting up with me throughout the years.

DEDICATION

For Grandma.

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INTRODUCTION



01 Path taken by a woman in a shopping mall whilst talking on her mobile phone. Horst Kiechle. 2007.

CONTEXT

Since the mid 1990s, the proliferation of mobile technology has dramatically changed the way we communicate with one another. Abridging distance and collapsing time, mobile technology has transformed the way we live, work, and play in our city. Who needs to plan exact meeting location and time when a call on the cell phone can locate a friend when you are in the area? Who needs to ask for directions when a simple search on Google Maps or a 'tweet' seeking advice and assistance can help you navigate through and about the city? We have become increasingly dependent on, almost inseparable from, our cellular phones and mobile devices as they enhance and assist our everyday activities. Communication through these has given us an alternative to having a face to face interaction with one another, providing additional means of social interaction that is the basis of our everyday activity. As well, mobile technology has altered our sense of place by disassociating the person from his environment as a real or authentic experience because he is not connected to any single location or scene, rather, he is connected to the multiple relations and affiliations in a virtual experience.

The focus of this thesis is not to argue whether these mobile communication devices are beneficial or detrimental to our social lifestyle and our sense of place, rather, this thesis investigates how architecture can respond to the implications brought about by these technologies. Some see it as a negative effect, an inward turning away from the ideal direct experience with the world, the people and places, as e-mails, SMS (short messages service or texting), and cellular communication continue to be alternatives and substitutes for face to face interaction. Others take on a more optimistic view positing that technological prostheses (such as the mobile devices) are an integral component to social development,

enhancing the way we see and do things in real places, and the way we communicate with one another. Regardless of the different perspectives on the subject, mobile technology has refashioned our relationship with one another and our relationship with the environment; transforming the way we communicate with one another and the way we perceived the environment that we are in.

PROBLEM

Mobile technology, for this thesis, refers to information and communication technology such as cellular phones, GPS navigation systems, mobile devices such as iPods, and mobile/wireless computing. Despite the strong linkage between mobile technology and the sense of space and place, architects are mainly absent from this discussion and technologists (such as programmers, media artists, and even architects alike) resort to augmenting existing architectural contexts, manifesting as media installations and software applications for the mobile devices. There is an obvious disjunction between the mobile technology and architecture, in the sense that the two have mostly stayed within their separate realms of design. Thus, it is the purpose of this thesis to seek a more meaningful relationship between mobile technology and architecture, and to speculate on a direction in architecture which responds more intimately to the implications shaped by the ubiquity of mobile technology.

CASE STUDY

DREAMING WALL

A. Scarponi, S. Massa, F. Pedrini, A. De Luca
Milan, Italy

The wall was conceived as an 'Info Forum', a vertical public space that reflects the piazza it fronts. The wall is seen as a tool for simultaneous, unexpected collective communication, creating a visual spectacle as a result.

The wall is white and constant during the day, but glows phosphorescent green at night. As a public digital billboard at night time, random text messages are projected onto the glowing wall. The text messages are generated in real time by people standing in the square or from somewhere else in the world through the internet. The visible textual images are produced by a chemical reaction between the projection from the computer controlled UV laser and the phosphorescent panels on the wall. The particular message lasts approximately fifteen minutes before being absorbed by the wall.

This is an example the challenges that architecture face today as it continues to strive towards a relationship with mobile technology. Although it creates a spectacle/event that offer a link between digital space and physical space, it falls in the realm of media installation in an existing architectural topography.



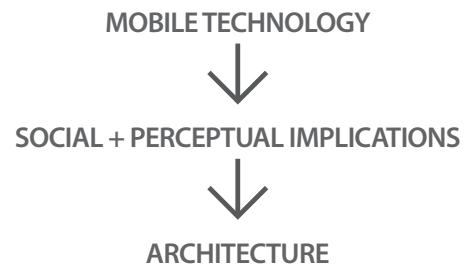
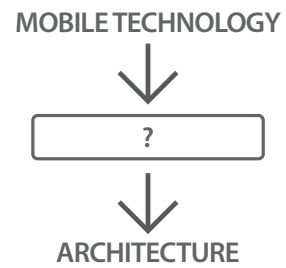
02 A Scarponi, S massa, F Pedrini and B Galassi, Dreaming Wall info-forum project, Milan, Italy, 2004

THESIS

This thesis project argues that architecture can better respond to the proliferation of mobile technology through its social and perceptual implications. The objective of this thesis project is not simply to demonstrate how mobile technology can be applied to the built environment, but to demonstrate that the integration of architecture and mobile technology can critically respond to the changing social conditions and perceptions brought about by mobile technology. This thesis investigates not simply how these technological changes influence the design of spaces and place, but furthermore explores how the social and perceptual implications of ubiquitous technology affects our design of spaces and places in the city.

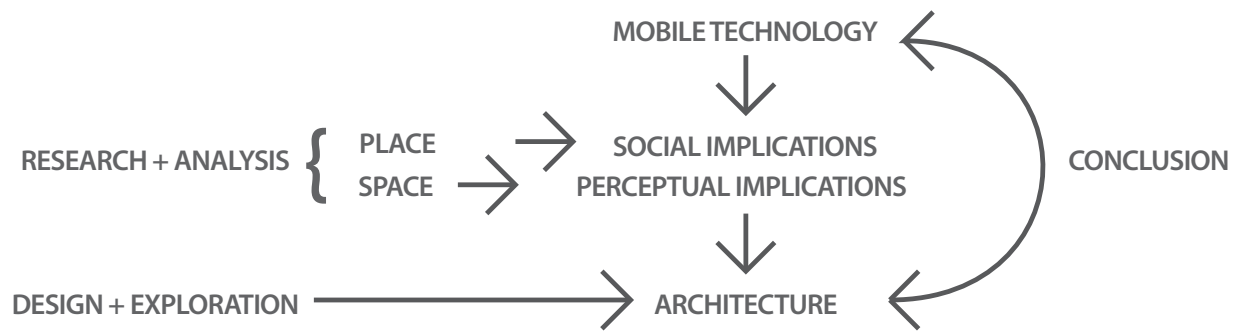
This thesis project takes the position that architecture is a hybrid process in the digital era, a negotiation between old paradigms of what constitutes the city and new parameters created by the social ubiquity of mobile technology. Blurring the lines between direct, mediated, and virtual experiences, we create our spaces beyond the spatial circumstances that are around us. In addition to the walls, windows and doors, other logics come into play in organizing space, time, and boundaries around the body. This thesis project is concerned exclusively with neither the physical – the bricks and mortar of our built environment or with the virtual, but illustrates a synthesis of direct and virtual experiences in an augmented reality – a mediated experience of the physical environment in the real world.

Thus, the thesis project revisits the role of public spaces in the digital era, when online social networks have replaced the street as the preferred place to see, be seen, and connect. As more and more of the online virtual experience is able to be interpreted as



03 Idea diagram illustrating the intention and position of thesis project.

an engagement within the 'public realm', the public spaces in the physical realm will remain an integral place for social engagement. Places of gathering have not disappeared as a result of our increasingly online social realm as we continue to have face to face direct interaction in the physical world, but opportunities for encountering the stranger is becoming infrequent and uncommon. Our online virtual experience is mostly oriented towards maintaining constant contact with our established social networks, and only satisfies a portion of our social needs. Political theorist Hannah Arendt describes public space as the place we encounter the stranger, where we breed tolerance through encountering differences in opinion (Greenfield & Shepard, 2007). Public spaces has always been the place to encounter the stranger, this thesis argues that they will continue to do so but architecture has the opportunity to enhance and provoke such social engagements as they become increasingly infrequent.



04 Idea diagram illustrating the methodology of thesis project.

METHODOLOGY

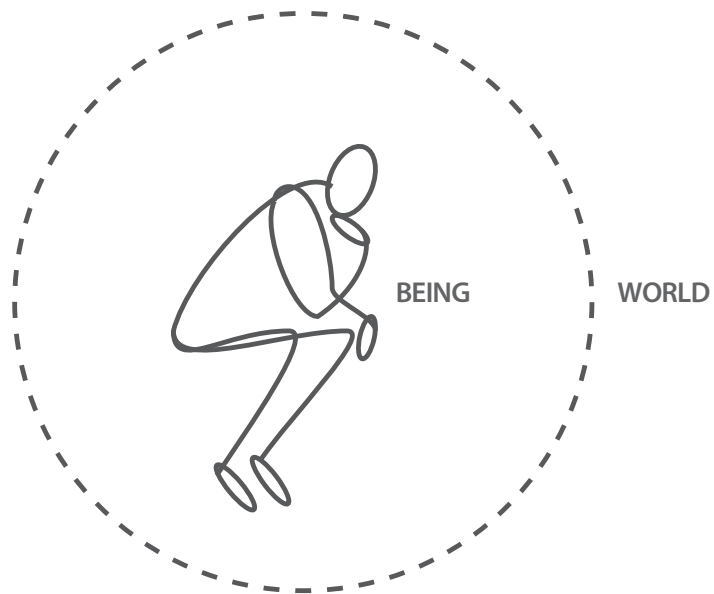
The thesis project argues that architecture can better respond to the proliferation of mobile technology through the social and perceptual implications in the way we communicate with one another and experience the environment. Thus, the thesis project begins by investigating the primary constituents that make up our perception of spaces and places in the city. The notion of space entails a different meaning than the notion of place, and therefore each offers distinctive implications in relation to mobile technology and the spatiality that it exists in. Space encompasses the logic that makes up our world, of how we perceive and understand the environment in which we ultimately exist. Thus, by examining the notion of space and how its meaning has changed, we can begin to understand the perceptual implications of our environment in the digital age. The idea of place has a different relationship between its occupants and their environment, a notion that cannot exist without its occupants. The ontological view of the world in the understanding of place will unveil the implications that exist between the people and their relationship with one another in the social realm, in other words, the changing social conditions brought about by mobile technology.

The thesis will then test these social and perceptual implications in theory against observation and analysis of real experiences. As some of the early observations suggest, mobile technology disembodies us from the direct experiences we have with our environment and one another. As a space that exists in disembodiment to the city, the underground PATH network in the downtown Toronto becomes the realm for expressing and discussing some of the social and perceptual experiences, and a test bed for possible intervention addressing those issues. As a controlled environment, design exercises were done to seek

ways in which architecture can provide opportunity to enhance, or even provoke social encounters between the occupants in the uncontested space that otherwise would not have occurred. A design framework follows the observation, analysis, and intervention of the PATH, formulating the basis of the design project.

Being the junction between the city and its disembodied space, Nathan Phillips Square in Toronto becomes the realm of design in real physical public space. The public space in the square and its connection to the PATH network becomes the venue for the a series of architectural interventions that as a whole, seeks ways in which architecture can provide the opportunity for unexpected encounters that otherwise would not occur in an uncontested space. Through a prototypical environment of a restaurant and its access to the square, the design demonstrates ways in which the integration of architecture and communication technology can ultimately address and respond to the new social conditions and perceptual implications brought about by mobile technology.

RESEARCH



05 Space as a dimension of human existence.

SPACE

CONCEPTS

The concept of space has always been the focus of western philosophy because it is seen as fundamental to engagement with questions concerning existence - the nature of being and the world. The problem of space is viewed as a dimension of human existence due to man's need to grasp vital relations in his environment, striving to bring meaning and order into the world which he inhabits (Norberg-Schulz, 1971). Heidegger, in his ontological writings from the book *Being and Time*, gives an account of this distinctive feature of human existence, which he claims that existence is spatial. He explains that, 'being in the world' – the fundamental idea regarding existence of being - is not merely of one self contained physically within a thing, but the engagement of being with other entities (Heidegger, 1996). The engagement with things can be considered a spatial experience because man perceives, and acknowledges his relations with other things in his surrounding, such as the natural and constructed environment around him. As architectural theorist Christian Norberg-Schulz describes, architectural space may be understood as a concretization of environmental schemata or images, which forms a necessary part of man's general orientation or 'being in the world' (Norberg-Schulz, 1971). Known for bringing the thinking of Heidegger to architectural theory, Norberg-Schulz explains that man orients to objects around him, where he adapts physiologically and technologically to the physical things that are around him, as well as interacting with other beings (Norberg-Schulz, 1971). The way man moves about and his actions include a spatial aspect, creating a relationship between his conscious being and the physical things around him. All activity has a spatial aspect since any activity implies movement and relationship to

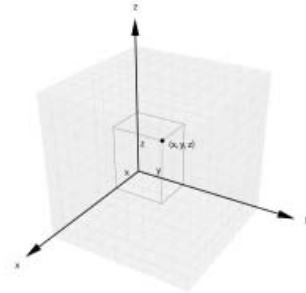
place: inside and outside; far away and close by; separate and united; and continuous and discontinuous (Norberg-Schulz, 1971). Therefore it is in this sense that space is considered an aspect of orientation, a constituent of the existence of being and the world. Frances Dyson agrees with this position, that without 'space', there can be no concept of presence within an environment nor can there be the possibility for authenticity that 'being in the world' allows (Dyson, 1998).

The notion of space has been and still is a fundamental part to western philosophy, particularly in the branches of metaphysics such as ontology and existentialism. This is due to the fact that space is, as Algra (1994) refers to it, "an ineliminable part of the furniture of the physical world, with respect to the way in which we experience that world." There have been many ideas on the concept of space since it is extremely difficult to reach a consensus about what it actually is. Discussion on the concept of space arose from early Greek philosophy, in which philosophers Leucippus and Democritus present a model of space through their insight on cosmogenesis – the creation of the world (Casey, 1997). They posit that cosmogenesis occurs with the interaction of discrete bits of matter within a circumambient empty space in which the empty space does not possess places or regions, in other words, a strict void. They argue that the world is made up of atoms that condense and form matter, and of the void - the open space that is not occupied by matter. They present an Atomist model of space where space is a void in which creation occurs, resulting in sensible matter that is in the space. Norberg-Schulz believes that early Greek philosophers conceptualized space as an object of reflection (Norberg-Schulz, 1971). He uses the example of Parmenides in which the ancient Greek philosopher maintained that space

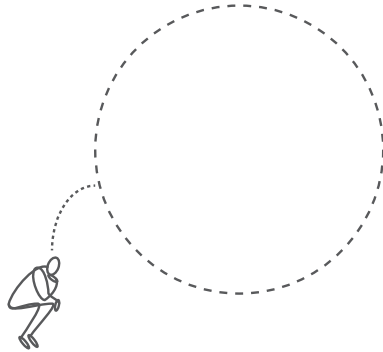
as such cannot be imagined and therefore is non-existent. Permenides states that truth cannot be known through sensory perception, but only through logos - pure reason. Since void is identified with nothing, therefore it does not exist. Thus, the ancient Greek concept of space can be thought of as ontological models that are understood through the mental capacity of the being in thought. In *Timaeus*, Plato presents an account of the formation of the universe in which he introduces the concept of chora – space. Chora provides a spatial location for the things that enter into and disappear from it, in other words, space provides both three-dimensional extension and a specific location for any observable particular to be ‘in’ at a given time; for any particular to be, it must occupy some spatial location (Zeyl, 2009). In *Physica*, Aristotle viewed chora – space as a common sense concept in which space is regarded as a three dimension extension - as a non personal view, whereas topos – place - denotes extensions location in relation to the surroundings as personal views (Algra, 1994). Epicurus regards chora – space - as a room when bodies are moving through it, whereas topos is space when it is occupied by a body (Algra, 1994). Stoics referred to space, as such, as that which can be occupied by a body (Algra, 1994). In any case, the concepts of space are a priori models that are independent of empirical knowledge which are imagined by the mental capacity of the thinkers of the time.

In Greek philosophy, space and time were still considered unclear logics where they could be looked upon as simple empirical tools for ordering sense data or as generalities in some way superior to the evidence supplied by the body’s sensory organs (Lefebvre, 1991). It was not until the 16th century that there was a critical shift in the concept of space by the thinking of Descartes, bringing

an end to the Aristotelian tradition. "With the advent of Cartesian logic... space had entered the realm of the absolute" (Lefebvre, 1991, p. 1). As object opposed to subject, the Cartesian coordinate system introduced Euclidean space as a mathematical model of understanding of space. Euclidean geometry remained the common representation of physical space until the creation of non-Euclidean geometries in the 19th century, such as the theory of relativity which presented a clearer approximation of physical space. Space is considered gravitational, which is curved and thus endowed with form, affected by the presence of gravitational matter. Hence the theory establishes a relationship between matter and space and between matter and form resulting in generalizing that matter is space and space is matter (Lefebvre, 1991). In the 20th century, the development in theoretical physics presented us with other understandings of space. The quantum theory for instance, presented the dualism of matter and space in which matter is built of elementary particles and waves that occupy space in its entirety. Despite the dominance of mathematical models to understanding space, there were other models to comprehending concepts of space, particularly that of Kantian space. In 18th century German philosopher Immanuel Kant, according to his theory of knowledge, suggests that space belonged to the a priori realm of consciousness (Lefebvre, 1991) in other words, space is understood independent of experience. Kant did not believe that space can be understood in terms of substance or relation, as non-objective features of the physical world that provides a transcendental and essentially ungraspable structure for organizing our experience of the physical world.



06 XYZ coordinates in Cartesian Space



07 Mental Space

MENTAL SPACE

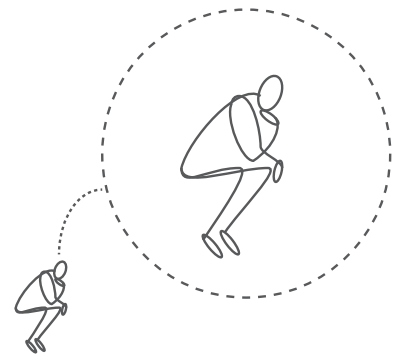
The philosophical and mathematical models previously mentioned can all be considered as mental spaces due to the fact that these concepts of space are merely abstract representations of physical space informed by logic and thought. Philosophical models were seen as objects of reflections in which the concept of space can only be understood through logic and reasoning (Norberg-Schulz, 1971), and therefore can only be considered as an image of physical reality. Similarly, Lefebvre notices when mathematicians appropriate space and time, they are inventing spaces that are indefinite and indeterminate; non-Euclidean spaces, curved spaces, x-dimensional spaces, spaces of configuration are all abstract spaces (Lefebvre, 1991). There is a disconnection between the abstract realm and the physical realm because the relationship between mathematics and reality is not obvious. Thus mathematical models suffer the same fate as philosophical models as a pure mental construct that can only be understood with sufficient knowledge.

Derrick de Kerckhove offers a view of this kind of space which more closely connects the abstract realm of the mind to the physical world. He maintains that there is always a need for the mind to comprehend what the body is involved with, that is the fundamental nature of the existence of our conscious being (Kerckhove, 2001). Due to the fact that most of the critical information from the physical world to the mind comes through the portals of the eyes, the mind develops imagination, which is essentially a visualization process in which images are created in the mind. When a person experiences space, a series of two dimensional images are transmitted from our eyes to the brain,

which the mind converts into a three dimensional representation of the physical external world. The image of the physical world exists solely in the mind of the individuals as mental space which is indefinite, similar to mathematical and philosophical models. This is due to the fact that each person has their own personal experiences of the physical world; the concept of space in the mental realm varies from person and person. Thus, mental space is a personalized image of the physical space outside and a fair representation, but it is a space that cannot be defined in finite terms due to the subjective nature of the process.

EXISTENTIAL SPACE

Space can also be understood through sociological and psychological models since physical and mathematical space concepts, as Norberg-Schulz believes, satisfy only a small part of man's original need for orientation (Norberg-Schulz, 1971). Furthering the idea of mental space, he suggests that there is a personalized concept of space in which man imagines with his mental capacity in relationship to the external physical environment he experiences. This concept of space he calls existential space, is formed from a relatively stable system of perceptual schemata – mental structures that represent some aspect of the world, such as images of the environment (Norberg-Schulz, 1971). Spatial relations are formed between the conscious being and his environment, such as proximity, separation, succession, closure, and continuity. Norberg-Schulz compares the basic structures of man's environmental image to the development of the child with respect to Jean Piaget's theory of cognitive structure. From birth to age 2, children familiarize themselves with



08 Existential Space



09 Stills from the movie Matrix

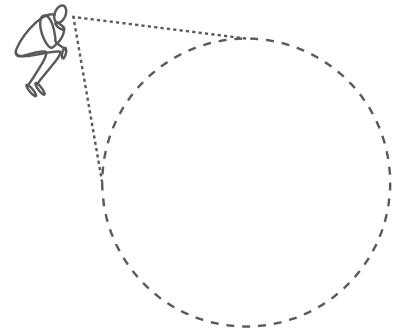
their surroundings from their experiences through movement and senses. As they grow older, they begin to think logically and eventually develop abstract thought. Children learn to recognize and to construct the world as a system of similarities, and to connect the things recognized with particular places, situating them in a more comprehensive totality, an existential space where they can orient themselves with the external world (Norberg-Schulz, 1971). This is the basic intuitive means by which man connects with this environment, by forming an existential space that he can relate to the external physical environment where he experiences and acknowledges his presence in the world. In this sense, space is viewed as the product of an interaction between the conscious being and the environment that is impossible to dissociate from the organization of the perceived universe.

There are elements of the physical external world that are associated with the elementary organizational schemata which constitute the existential space identified by Norberg-Schulz (1971). The idea of proximity is recognized with the establishment of centres and places, in which the notion of a centre or place such as a home presents the first point of reference that man orients to. It is the point where he acquires position as a thinking being in space, and as well, is the point of departure from which we orient ourselves and explore the environment around us. Existential space, in most cases, is comprised of many places and thus a space cannot be understood in isolation because it is situated within a larger context (Norberg-Schulz, 1971). The multiple places infer two things, that there is a relationship with respect to orientation between places and a connection between the places. Norberg-schulz proposes a simple model to understand this existential space, where a horizontal plane is pierced by a vertical axis due to

gravity, which serves as the basis for the grounding of directions. And on this plane man chooses and creates paths which connect him from place to place, as well as giving the existential space a structure (Norberg-Schulz, 1971). Paths divide man's environment into areas – domains to which we do not belong and which do not function as goals. Together they are essential constituent elements of existential space which present a real dimension of human existence.

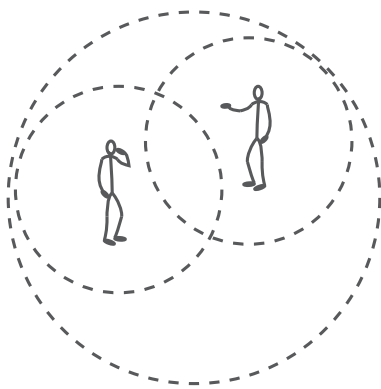
PERSPECTIVAL SPACE

Ideas about space are also apparent in the advancement of media and technology. Take the Renaissance period for example: the development of the perspective drawing technique reinforced a concept of space characterized by the predominance of vision and linearity (Kerckhove & Tursi, 2009). The perspective is essentially a two-dimensional representation of the three-dimensional physical space generated by intersecting the cone of vision by a plane surface as observed by Brunelleschi in the 15th century (Perez-Gomez & Pelletier, 1997). The perspective places the observer outside the spectacle, and creates a clear distinction between the objectivity of what one sees and the subjectivity of who does the seeing (Kerckhove, 2001). This creates the bodily abstraction and characterizes space as void and neutral container. In addition, by displacing the viewer outside the spectacle, the viewer is in a position of power in the sense that the gaze is transferred from god to man, which establishes a centre within the space. The point of view nature of the perspective establishes physical and psychological, as well as an ontological position of the self because it is a unique experience (Kerckhove, 2001).



10 Perspectival Space

The dominance of vision and linearity in the concept of space is apparent in the architecture of the times. In classical antiquity, objects in space were designed as spectacles where the visual experience dominates the perceptual experience of the viewer. The Greek amphitheatre separated the viewer from the object, as did the Parthenon from the visitors at the Acropolis. The visitors are engaged with an experience of the space that is predetermined by the configuration of spaces established by sight lines and viewpoints. The focus on the design of spaces was dominated by the eye of the spectator. Lefebvre and Kerckhove both recognize the dominance of the visual and the primacy of the façade in the Renaissance period (Lefebvre, 1991; Kerckhove, 2001). Renaissance architects designed their buildings according to the principle of perspective, where the overall perception of the building is dominated by visualizing its façade, such as Alberti's Santa Maria Novella.



11 Post-perspectival Space

POST-PERSPECTIVAL SPACE

The proliferation of information and communication technologies and the cyberspace, have completely transformed the notion of space that was formulated with technical advances of the perspective in the Renaissance period. With the proliferation of cyberspace, we are no longer spectators to the spectacle. The notion of space that was once dominated by vision is diminishing, shifting to a concept of space that is informed by immersion. "Seeing, is replaced by being, and the supposedly unmediated experience of immersion" (Dyson, 1998). Contrary to the former perspectival space, this immersion encompasses each and every

one of our senses, not just the eye.

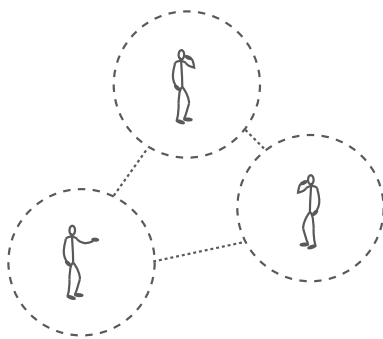
"We enter into contact both digitally and physically, with space, no longer limiting ourselves to looking at it from afar.... Space is therefore, no longer an empty and neutral void that can be described on a two-dimensional flat surface using arithmetic-geometric relations of the perspective. Rather, it is continuously generated and regenerated by the networks that structure it, by the conflicts that vivify it, by the living beings that inhabit it." (Kerckhove & Tursi, 2009, p. 49)

One of the factors that led to the post-perspectival space is the development of 20th century physics. The understanding of space brought about by theory of relativity and quantum theory, in which space is conceptualized as field of forces and counter-forces which emerge from the actions that take place within it (Kerckhove & Tursi, 2009).

The shift from a perspectival to a post-perspectival concept of space is apparent in the conception of architectural spaces as well as architectural theory. There was a shift from conceptualizing space / architecture as an object / spectacle to conceiving space as a field of activities and interactions [forces], in which the conscious being is immersed in the constructed environment as participant as opposed to user. Bernard Tschumi illustrates this in his architectural writings, in which he believes that there is "no space without event, no architecture without program" (Tschumi, 1996, p. 139). He argues that architecture cannot be dissociated from the events that 'happen' in it, in other words, the activities, action, and movement that take place in the space. Thus, his architecture

reflects his theory by focusing on the program and the sequence of spaces [movement] as opposed to the tectonics and aesthetics that dominated the modernist ideologies.

Similarly, the post-perspectival concept of space is also apparent in the architecture of Rem Koolhaas. His work is strongly ordered by the trajectories of movement through the spaces, as suggested by Kim Dovey (2010). Using Koolhaas' Seattle Public Library as an example, Dovey suggests that the vertical movement via escalators, stairs, ramps, and lifts was the central focus of the design, as they provided access to the fields of events and encounters that occur in the space. Like the fields of forces and counter-forces, the space is programmed for indefinite function and chance encounters, where it encourages an eruption of events and opportunities for action. As opposed to the traditional design process with a particular hierarchy of spaces and predetermined narratives of spatial movement, Dovey observes that Koolhaas generally works towards a spatial structure that allows for a multiplicity of choices for circulation and social encounter.



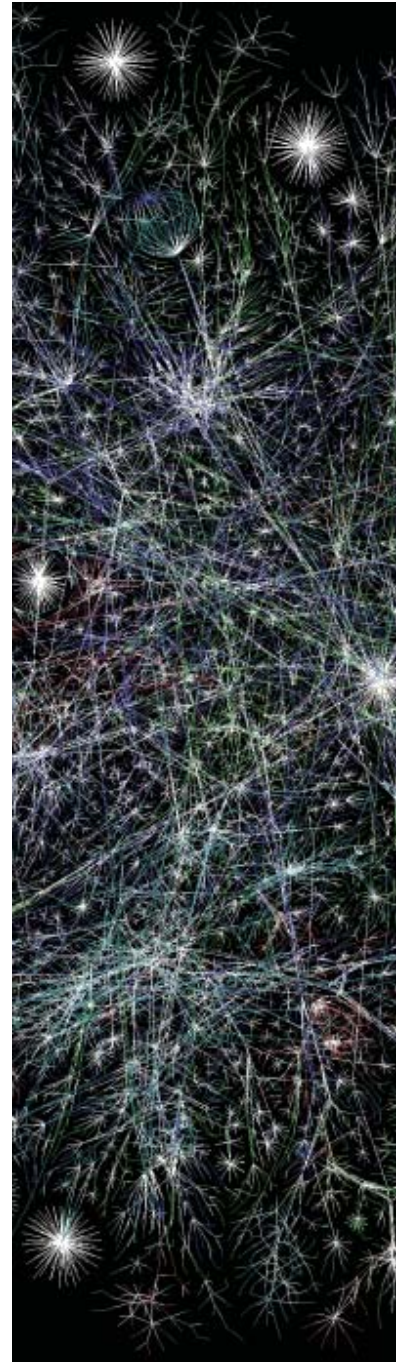
12 Cyberspace | Electronic Space

CYBERSPACE | ELECTRONIC SPACE

The development of digital technologies such as ubiquitous computing, mobile and wireless communication technologies, and their expanding network infrastructure have created an entirely new concept of space. The term cyberspace was coined by science fiction writer William Gibson, who envisaged a world where wireless technologies and virtual reality immerse part of each and every one of our lives, prior to the proliferation of the globalized internet in the early 1990s.

"Cyberspace – a consensual hallucination experienced daily by billions of legitimate operators, in every nation, by children being taught mathematical concepts... A graphical representation of data abstracted from the banks of every computer in the human system. Unthinkable complexity. Lines of light ranged in the non-space of the mind, clusters and constellations of data. Like city lights, receding..." (Gibson, 1984, p. 51)

Not too dissimilar from what Gibson envisaged in 1984, the ubiquity of a global data network has completely engulfed our lives and completely redefined our notion of space. Media theorist Frances Dyson (1998) considers cyberspace a virtual environment that mirrors the real: the physical, social, economic and ideological world that we currently inhabit. As previously stated, mental space is viewed as a reflection of the real, as a personalized mirror image of the physical space outside. Kerckhove (2001) refers to cyberspace as internal space [mental space] that is restructured by electronic media, television, radio, computers and the internet. Both mental space and cyberspace are similar in the sense that they are both, more or less, direct representations of the physical reality we are in. What distinguishes the two is the accessibility of the spaces. Mental space, as a personalized representation of the external world, can only be accessed by the individual as the image dwells in the mind. On the other hand, cyberspace though hidden in wires and pulses, is visible via the computer screen. The screen, as an electronic device, has the ability to project what is essentially a two dimensional digital image or series of images of a multi-dimensional world, similar to the visualization process of how we experience space. In what began as the background



13 The Opte Project. A visual representation of the internet.



14 Community in Second Life

images, sounds, lights, and colours on the television sets in each home, the screen has standardized an interface that connects the eye and how it sees (Dyson, 1998). One explores and navigates through cyberspace via the screen as the interface between the physical realm and virtual realm.

Cyberspace can be viewed as more than just a concept of space, but also as an instance of space because virtual communities develop and grow in the electronic space (Cicognani, 1996). Cicognani believes that 'internal' cyberspace offers the same potential for activities that take place in the external physical world. Using Lefebvre's framework for defining space, Cicognani compares the attributes of cyberspace with those of physical space, mental space and social space which Lefebvre believes constitutes the world. First, cyberspace offers the possibility of action which Cicognani refers to as 'possible physical transformations' inside the virtual space. For example, the changes in the programming language will affect the electronic space and its conceptualization. Second, cyberspace offers livability or the possibility of dwelling in a space, which involves the existence of organizing structures that form the basis for the formation of communities. Third, communities are constructed in cyberspace despite the lack of location, similar to Lefebvre's social space. Communities exist independent from their spatial organization, beyond their geographical location in the physical world. Thus virtual communities exist in the same manner as a fundamental constituent in space. And lastly, there is time and spatial organization in cyberspace, an underlying system much like the one in the physical world that gives structure to society. Thus, under these circumstances cyberspace can be considered an instance of space.

Cyberspace exists simultaneously with physical space, mental space, and social space. Cyberspace becomes another venue for consciousness itself (Benedikt, 2001). Dyson (1998) describes cyberspace as an 'other' place to enact the deconstructed self, a self whose multiplicity and ambiguity is continually reinforced as the body seems to increasingly inhabit the dematerialized world that technology creates. With the proliferation of information and communication technologies, we are constantly immersed in cyberspace. We have grown attached to this dematerialized world to which our conscious being permanently inhabits this other world to the extent that cyberspace becomes more than a space, but 'a place and a mode of being' (Dyson, 1998).

SOCIAL SPACE

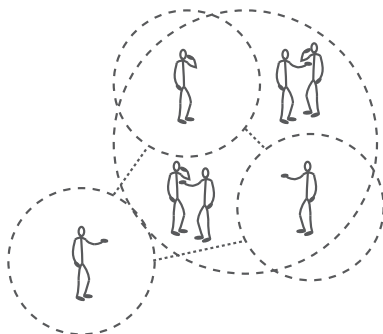
If physical space is the perceived space, mental space as the conceived space, then social space can be considered the lived space. Lefebvre (1991) also thought of space as 'fields', just as molecular, electromagnetic, and gravitational forces are fields in physics. He suggests that there are three 'fields' that constitute the world: physical space, mental space, and social space. Physical space refers to the cosmos, the natural world we experience as our sensory phenomena. It is also the place that houses the products of our imagination such as projects and projections, symbols and utopias. The mental space, as mentioned previously, satisfies the 'logico-epistemological self', it is a space where we form logical and formal abstractions. Social space is the space that we inhabit and live in, where social interactions and activities occur.



15 Social Space

"[Social] space is not a thing among other things, nor a product among other products: rather, it subsumes things produced, and encompasses their interrelationships in their coexistence and simultaneity – their [relative] order and/or [relative] disorder. It is the outcome of a sequence and set of operations, and thus cannot be reduced to the rank of a simple object." (Lefebvre, 1991, p. 73)

In other words, Lefebvre argues that all spaces are socially produced, a production of the social relations, interactions, and activities that happen in the space. This contrasts with the other concepts of space where they are seen as objects, single entity models that are self-imagined. Lefebvre argues that space is not an inert, pre-existing given entity but rather a continuous production and reproduction of spatial relations. The thinking of Heidegger also reinforces this concept of space, to which he acknowledges that the existence of being encompasses a relationship, interaction with others; being in the world is being with others in the world (Heidegger, 1996). As opposed to Descartes' "I think therefore I am", Heidegger maintains that relationship to others is a crucial part of being and that one can not acknowledge being alone without grasping the idea of being-with.



16 Augmented Space | Hybrid Space

AUGMENTED SPACE | HYBRID SPACE

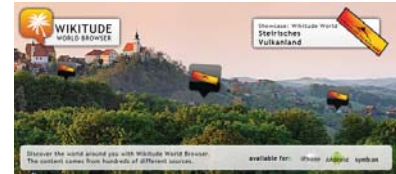
Following Lefebvre's theory with the understanding of space as a combination of different 'fields' - physical space, mental space, and social space, Cicognani (1996) adds that cyberspace can be considered as the 'fourth partition' of space that is in co-existence with the other 'fields'. Manuel Castells (2007) elaborated on the

relationship and the interaction between these different 'fields' in the context of the information and communication technology in the digital era. He categorizes two types of spaces: space of flows and space of places.

"Space of flows links up electronically separate locations in an interactive network that connects activities and people in distinct geographical contexts. Space of places organizes experience and activity around the confines of locality." (Castells, 2007, p. 444)

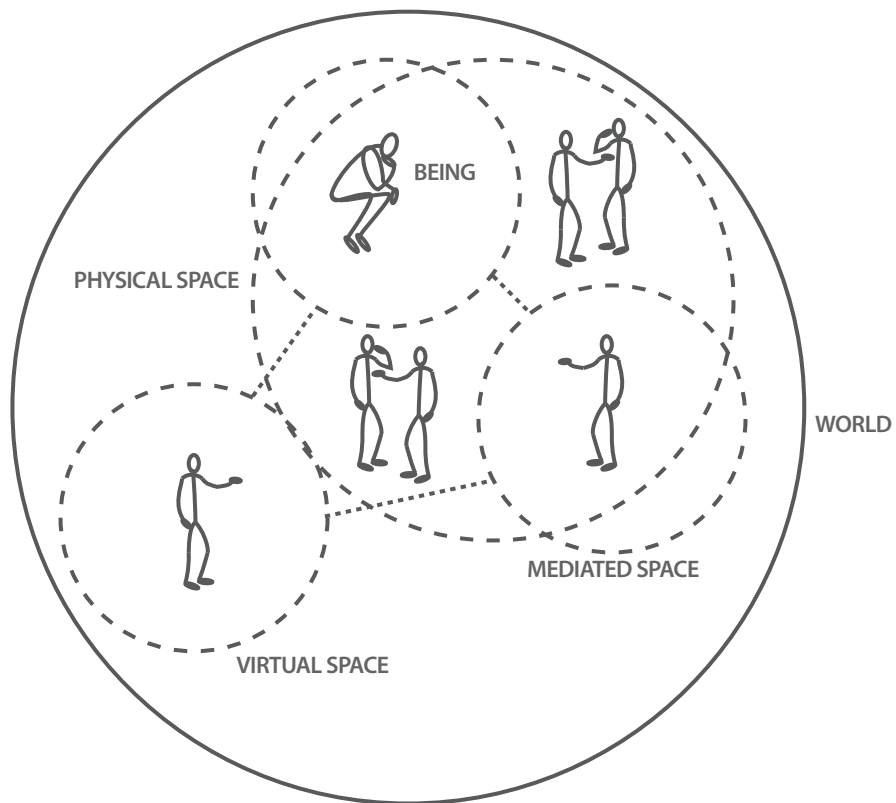
Castells acknowledges that there are competing logics between space of flows and the space of places, or cyberspace and physical space, respectively. "Our cities do not disappear in the virtual networks, but they are transformed by the interface between electronic communication and physical interaction, by the combination of networks and places" (Castells, 2007, p. 445). At the same time, our cities are made up of spaces of flows and places, and of the relationships between the two. In other words, cyberspace co-exists with physical space when they share the same spatial location within of cities. Yet their logics are distinct, in the sense that online experience remains distinguished from face-to-face experience.

Many have acknowledged the co-existence of cyberspace and physical space. The boundary between the virtual and the physical that once separated the two realms is dissolving (Mitchell, 2003). Eric Kluitenberg (2007) refers this combination of network and places as 'hybrid space', in which the public is reconfigured by a multitude of media and communication networks that are interwoven into the social function of space. Aurigi (2008) refers to



17 Wikitude World Browser

this phenomenon as 'augmented space', where virtual and physical spaces are no longer two separate dimensions, but are just parts of a continuum, of a whole. Networked intelligence is being embedded everywhere, in every kind of system in the physical space, where digital information is sent back and forth through the networks in electronic space. And more and more, there appears to be a causal relationship between cyberspace and physical space where events in one are being reflected in the other (Mitchell, 2003). Mitchell illustrates, that bricks and mortar have not been replaced by servers and telecommunications, but rather electronic commerce entails the sophisticated integration of digital networks with physical supply chains.



18 Space as a negotiation between direct physical experiences, online virtual experience, and indirect mediated experience

TRENDS

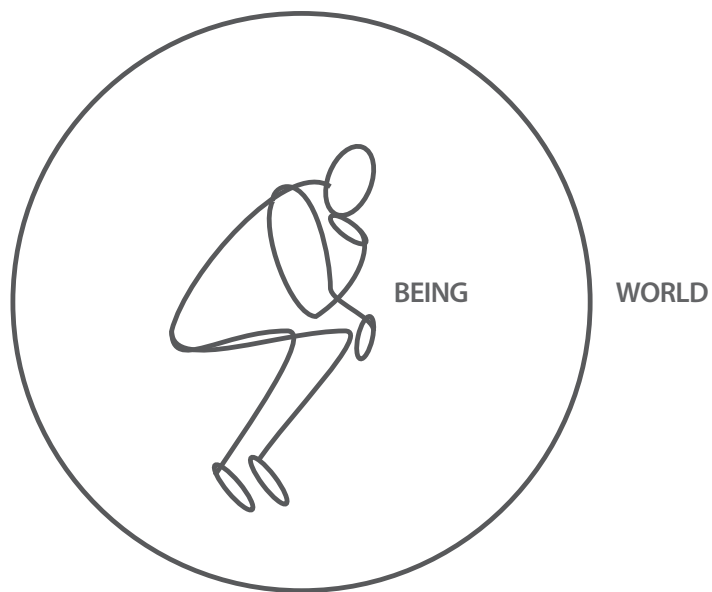
There have been many attempts at understanding space because spatiality is an essential constituent of our existence in this world. As previously mentioned, man has an instinctive need to bring meaning and order into the world in which he lives in, at a level of self-actualization where he acknowledges and is aware of his own conscious being in existence with other entities in this world. This can only be attained by establishing relations between our own ontological self and the surrounding environment around us as we formulate a concept of space through our empirical experiences and logical thoughts. Early Greek philosophers present us with a concept of space that resides deeply in logic. From the ancient Atomist model of space where it is an empty void to the Platonic chora where it is the world-body that is given and in which creation occurs, the philosophical model presents an abstract representation that is disjointed from the perceptual experience of the physical realm. Mathematicians and scientists attempt to narrow this gap between abstract space and physical space by employing a concept of space based on N-dimensional geometry and physics, where empirical principles are applied to render a model that is more structured and quantifiable, resulting in a collective understanding of space that is much more comprehensible. Sociological models present an understanding of space that is not defined by what it is, but rather by how it is formed through, social values and meanings.

The rise of cyberspace or electronic space has brought a new level of complexity to the philosophical, mathematical, and sociological conception of space that had been established prior to the proliferation of information and communication

technologies. As previously mentioned, the virtual realm created by these technologies [cyberspace] can be considered an instance of space due to the fact that it shares similar characteristics as other instances of space such as the physical space and mental space that has already been established as a dimension of space. Communities exist despite the lack of location in physical space and independence from their spatial organization, as they exist beyond their geographical location in physical space. Cyberspace has not replaced the physical space in which we dwell, but has enhanced and mediated our experiences in physical space amongst our constructed environment. As an instance of space, cyberspace co-exists with the physical, mental, and social spaces that share the same spatial location within our cities. Their competing logics keep them distinct from each other, yet their separation as discrete dimensions are dissolving with the advancements in the information and communication technologies. We arrive at a concept of space that is a holistic assembly of distinct instances co-existing in a hybrid reality.

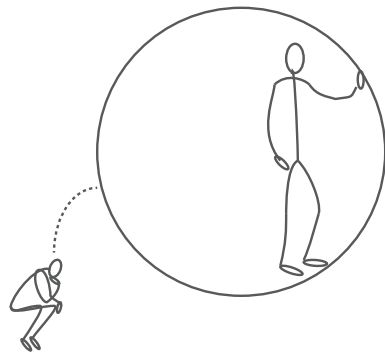
From perspectival space to post-perspectival space, architectural thinking, theories, and design directly correlate to the ideas of space in time. The idea that spatiality is experienced through vision has influenced architects to design spaces that are dominated by the point of view of the spectator, resulting in the dominance of the façade and constructed spaces that were very much linear in the time of the perspective. Developments in modern physics brought about a new understanding of space which inspired architects like Bernard Tschumi and Rem Koolhaas to conceptualize spaces as 'fields' of forces which emerge from the actions that take place within them. The focus of the design became the movement and interaction; the events in architectural

space as opposed to the aesthetics, tectonics, and spatial hierarchy. Contingent relations, forces, trajectories, and patterns of movement became the areas of design expression rather than the objective spaces themselves. With the proliferation of information and communication technology, this thesis will examine how architects can respond to this new understanding of space.



19 Place as a dimension of human existence.

PLACE



20 Place as an absolute as opposed to a void.

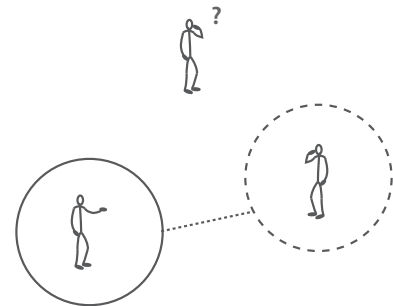
CONCEPTS

The idea of space has always been the focus of western philosophy because it has to deal with the fundamental problems concerning existence - the nature of being and the world. Greek philosophers Leucippus and Democritus presented an Atomist model of space where cosmogenesis – the generation of the world occurs within a circumambient empty space where indivisible bits of atoms condense to form matter. In other words, creation happens in an open space that implies a 'strict void' (Casey, 1997). Despite the importance of space as an essential dimension of existence, to exist in space implies a different meaning than to exist in place. In contrast to the Atomist model, Plato presents a concept of space that is plenary, which he illustrates through the idea of the receptacle as a filled space as opposed to a void. The receptacle has a three-dimensional extension that is observable therefore it is not a void but a filled space that is in the realm of the absolute. It is also not placeless because it occupies a spatial location as a sensible 'particular', providing a situation for all things to come into being in place; a scene of implacement that exists prior to creation (Casey, 1997). In the Platonic model, place can be said to be dominant over space where the former implies finite locatedness and where creation actually occurs and the latter implies indefinite extension that is initially given prior to creation. Aristotle presents a model not so dissimilar to the Platonic view of place where he posits that place assumes priority over the infinite, void, and time. He suggests that without place, things would not only fail to be located but they would not even exist because they would have no place to be the things that they are; "everything is somewhere and in place" (Casey, 1997, p. 71). In other words, Aristotle suggests that place provides more than mere position; it gives

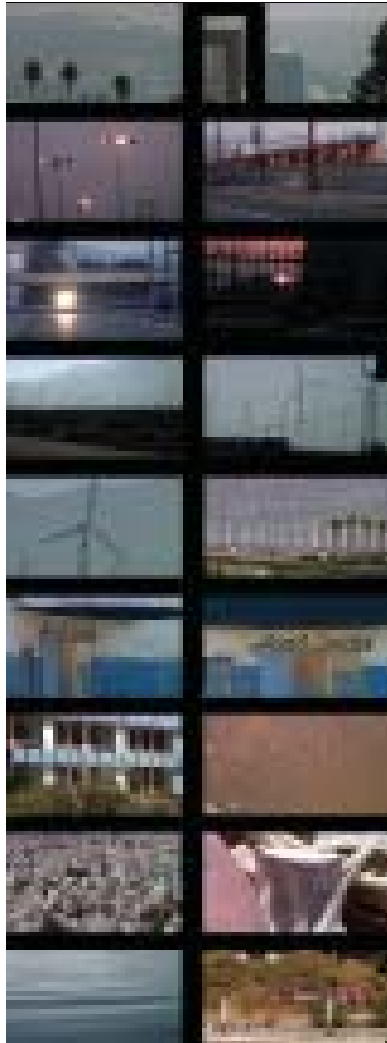
active support to what it locates. Thus, both Plato and Aristotle suggest that cosmogenesis entails topogenesis – the production of particular places where things come into existence in place.

The Platonic and Aristotelian models present a conception of place as something that is confined which provides for man's needs for location and boundaries, a sense of belonging in the vast unfamiliar territory in which he finds himself. But man also longs for freedom and limitlessness that is connoted by space. Atomist Epicurus presents a generic space that consists of three entities: topos [place], kenon [void], and chora [room] that satisfy both the need for location and the freedom for movement (Casey, 1997). This very notion spawns an idea about space and place in Hellenistic and neo-Platonic thought where place is the part of space that a body occupies, secondary to the universal space in which it is in. The diminishing idea of place continued well into 17th and 18th century where scientists and philosophers assumed that places are merely momentary subdivisions of a universal space. The focus on space in the scientific realm of physics continues to reduce the idea of place to nothing but a means of measurement. Newton considers place as only a part of space, a mere portion of that which is already there as a universal given in absolute space (Casey, 1997). Similarly, in Descartes' analytical geometry, place is nothing more than pure position, a mere point that is located on one of the XYZ axes that define the dimensionality of space. Thus, space as a measureable and predictable entity took precedence over place as an idea that is 'mathematizable' or quantifiable and therefore comprehensible to the human mind.

Place returned as the central entity in philosophical discussion



21 Man's need for location and boundaries



22 A|Um Studio, SUTURE, SCI-Arc and TELIC galleries, Los Angeles, California, November 2005–January 2006. An index of gestures and materials. Stills from the SUTURE installation.

about the world with the thinking of Husserl and Merleau-Ponty, where they believe that there is an internal tie between the body of an organism and the places that are inhabited by that organism in the environment. “Far from my body’s being for me no more than a fragment of space, there would be no space at all for me if I had no body” (Casey, 1997, p. 202), Merleau-Ponty suggests in his 1945 book *Phenomenology of Perception* that it is primarily through our lived body that we have access to the world; that without such a body there would be no world at all. Hence, Merleau-Ponty presents another approach where, as opposed to regarding place as a total phenomenon, place is experienced and known through the lived human body. Place, therefore, is considered with regards to experiences of being because place cannot exist in the absence of being, and being without place. From an ontological standpoint, place is inseparable from being or existence in the sense that to exist is to exist in a place (Casey, 1997). In other words, when we talk about place, it is always in relation to the conscious being or beings, as opposed to space where it is possible to conceive such an entity in abstraction as a separate and distinct entity.

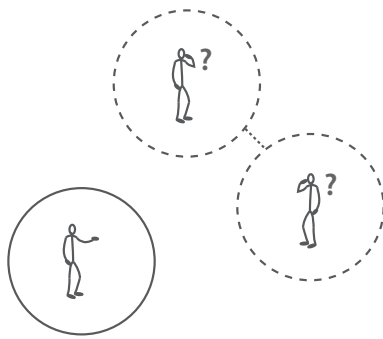
All spaces can be considered places and vice versa. “No room is just a space; it is always a place we are either entering, occupying or exiting” (Kingwell, 2008). Geographer Yi-Fu Tuan (1977) suggests that space becomes place when individuals familiarize with a location and over time, endow it with value and meaning. He considers place to be a type of object which defines space, giving it a geometric personality. Tuan uses the example of a new resident to an unknown neighbourhood, where it is just a blurred space ‘out there’. By identifying significant localities, such as street corners and architectural landmarks, the new resident learns and

becomes familiar with the neighbourhood. He suggests that a place achieves concrete reality when our experience of it is total through all the senses to the point where there is an active and reflective relationship between the mind and the environment. Thus, it is in this sense that space becomes place when it feels thoroughly familiar to us. Similarly, Lynch (1960) articulates the process in which space becomes place in his 1960 book *The image of the city*. He suggests that individuals understand the environment surrounding them by constructing mental imagery about the space in which they move with the elements of the city: landmarks, edges, districts, paths, and nodes. Casey (1997) shares a similar view as Tuan and Lynch in the sense that places are “determinations” of an already existing space. Space is a neutral, pre-given medium that becomes place with the inscription of particularities of culture and history. He acknowledges the fact that the understanding of place requires perception, in other words, there is no knowing or sensing of a place except by being in a position to perceive it. Therefore, since we are never without perception, we are always emplaced, forming one of the basic dimensions of our existence.

DIGITAL IMPLICATIONS

With the growing ubiquity of the internet since the early 1990s, many sociologists, psychologists, and media theorists have depicted scenarios with regards to our world that range from the demise of the city altogether by a ‘cyber’ society based entirely on the fluidity of spaces and related functions, to the establishment of a parallel ‘virtual’ city enhancing, rather than annihilating, the physical city in which we dwell (Aurigi & Cindio,

2008). For example, William J. Mitchell (1999) suggested the death of bookstores and bank branches, in which physical things are replaced by online-commerce and e-banking. He suggests that books and other products can be purchased online, shipped directly from the warehouse and to your home, eliminating the need for stores all together. Despite the inaccuracy of this prediction, which Mitchell corrected in his later writings, it gives as a glimpse of the influential power and possibilities of information and communication technologies (ICT) on the social organization and spatial functions of our world.



23 Dematerialization of place

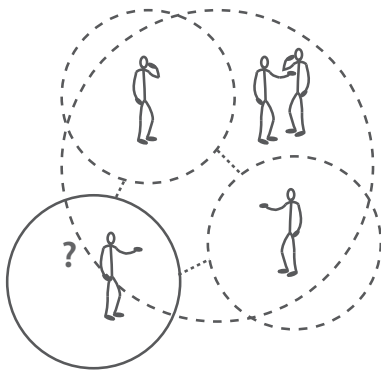
Information and communication technologies have major effects on the notion of place, induced mainly by corollaries of dematerialization and demobilization. Dematerialization refers to the replacement of big physical things by miniaturized things that accomplish much the same result, such as letters being replaced by e-mails (Mitchell, 1999). This poses a problem to the concept of place since diminishing physical objects means that there is nothing to perceive, perception being a fundamental of place as previously mentioned. One cannot perceive what is not there, and therefore cannot formulate and create a sense of place. Similarly, demobilization has an indirect casual relationship with the concept of place which will ultimately lead to the same result. Demobilization operates on the notion that moving bits are immeasurably more efficient than moving people and goods (Mitchell, 1999), in other words, the computer allows an individual to carry out a variety of tasks without moving anywhere. This will drastically refashion the relationship between architectural spaces with the specificity of the program attached to it. Thus, the combination of dematerialization and demobilization will result in a diminishing physical realm that affects our notion of place.

In contrast to demobilization, information and communication technologies also provide the freedom for mobility. Wireless technologies have enabled us to physically move about, without being confined to certain places for particular tasks. For example, we no longer 'have to' be at the workstation in the office to retrieve files from our desktop computers or answer calls from a landline telephone [even though a large number of us still do]. We are able to work from our laptops at home or at the local coffee shop, or keep in touch with clients and colleagues on overseas travels or lunch breaks. With our mobile phones and handheld devices, we are always connected with one another and are accessible around the clock. The problem with such a mobile world is that there is no repetition of similarities in connection with a stable system of places (Norberg-Schulz, 1971). As Tuan and Lynch suggest, space becomes place when the individual becomes familiar with it through experiences with the particular through mental imagery. The freedom for mobility disrupts and prolongs this process of place-making. Norberg-Schulz (1971) explains that the most basic experience is that of the things that are permanent. He illustrates his point with the development of the child and his sense of place, in which the child learns to recognize and construct the world as a system of similarities, and connects the things recognized with particular places. Tuan (1977) agrees that too much mobility will not give the man enough time to establish roots because the 'feel' of a place takes too long to acquire as it is made up of experiences that are repeated day after day over the span of years.

"Places are identified with what does not change, in which their sense of place, character, or identity is seen

as relatively stable. Places are experienced primarily in terms of stabilized contexts of everyday life and they are a primary means by which we stabilize our identities in that world.” (Dovey, 2010)

Therefore, a mobile world would not allow for the establishment of schemata, which is essential in forming a sense of place.

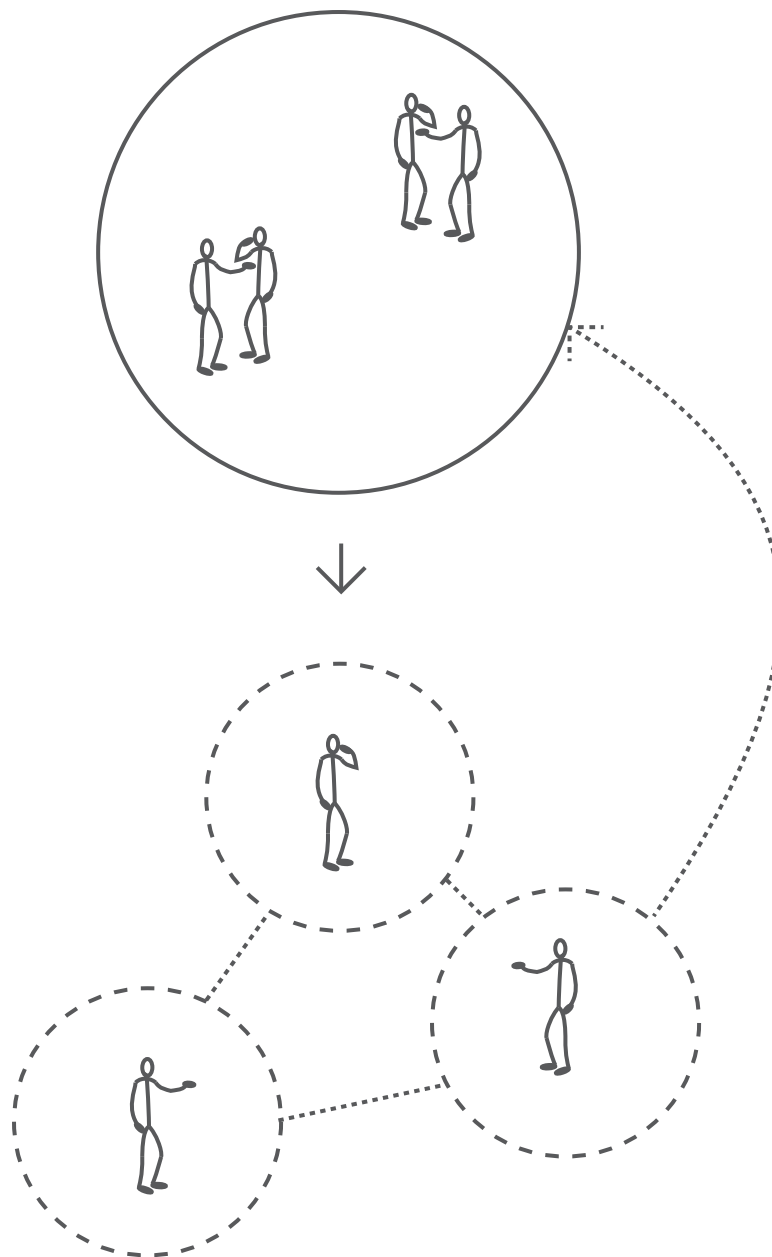


24 Disembodiment from place

Augmented spaces [or mediated spaces] are often compared to globally characterized non-places such as airports and shopping malls due to the displacement effect of digital technologies. Augmented spaces refer to any built environment where it is in coexistence with layers of information and media content (Allen, 2008). For example, the large digital displays that border downtown Toronto’s Dundas Square create a mediated experience for the people in the public square where the transitory setting of the digital displays overlaps with the fixed and tangible physical structure of the built environment. Most airports and shopping malls are considered non-places because, generally, they have little or no features that distinguish them from others of their kind around the world. They function as signs rather than places, immersing the user in a self-conscious form of ritual, bearing little relation to any actual time or location (Dyson, 1998). Information and communications technologies can induce the same effect as non-places, taking their user somewhere else that denies or competes with the actual physical place that they are in (Aurigi & Cindio, 2008). Similar to a person listening to music over headphones, music generates an aural three-dimensional virtual reality that puts the person in a different place than the one he is in without the headphones on (Dewdney, 1998). In augmented spaces, the overabundance of information and events has the

effect of disassociating the person from the space as a real or authentic experience because he is not connected to any single location or scene, one that is essential in establishing a sense of place (Allen, 2008).

The overabundance of information has other indirect effects on our sense of place. According to Koestler's theory, memories left by past events undergo simplification and distortion or elaboration and enrichment as the schemata of stored experience are affected by the incoming sensory experience (Greene, 1976). With the large amount and constant input of information experienced by individuals in the digital era, previously established meanings change because of the pressure created within the mediated environment and within the perceiving organism, similar to the effect that causes the changes in the meaning of words over time and culture. In addition, media technologies such as virtual reality and digital simulations are becoming more and more realistic, to the point where one may have difficulty distinguishing the dream world from physical reality at the encounter or memories of that experience. In addition, our experience with a place is being skewed by the mediated encounters we have with that place (Chaplin, 2002). More and more we have prescribed images of a place before we even arrive there. When we do have the opportunity to experience the real thing, it often can only be experienced as something that has been overly mediated, resulting in a bias and untrue perception of the place.



25 Sense of place: from absolute location in physical space to relative networks in virtual space

TRENDS

There are those who argue that cyberspace, as an instance of space, is a legitimate means of establishing a sense of place. Mitchell (2003) suggests that the constants in the world are no longer provided by the continuous stability of the physical, as the sense of continuity and belonging more and more derives from being electronically networked to decentralized people and places. For instance, we log onto our favorite online forum to discuss our hobbies and interests as opposed to attending a social club at the school, or immerse in the world of MMORPG [massively multiplayer online role-playing game] rather than engage in game of collectible card game at a friend's house. More and more social activities that are rooted in places in the physical realm are diminishing as these encounters happen in cyberspace over the internet.

"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. Place become less an absolute location fraught with tribal bonds or nostalgia, and more a relative state of mind that one gets into by playing one's boundaries and networks." (McCullough, 2006, p. 29)

Casey (1997) agrees that a new sense of place emerges in the idea of virtual places. In these virtual places, there is a distinct impression that the mediated person or figures though not physically present, present themselves in a quasi face to face interaction in the sense that they have access to each other. A sense of virtual co-implication occurs with the notion that a

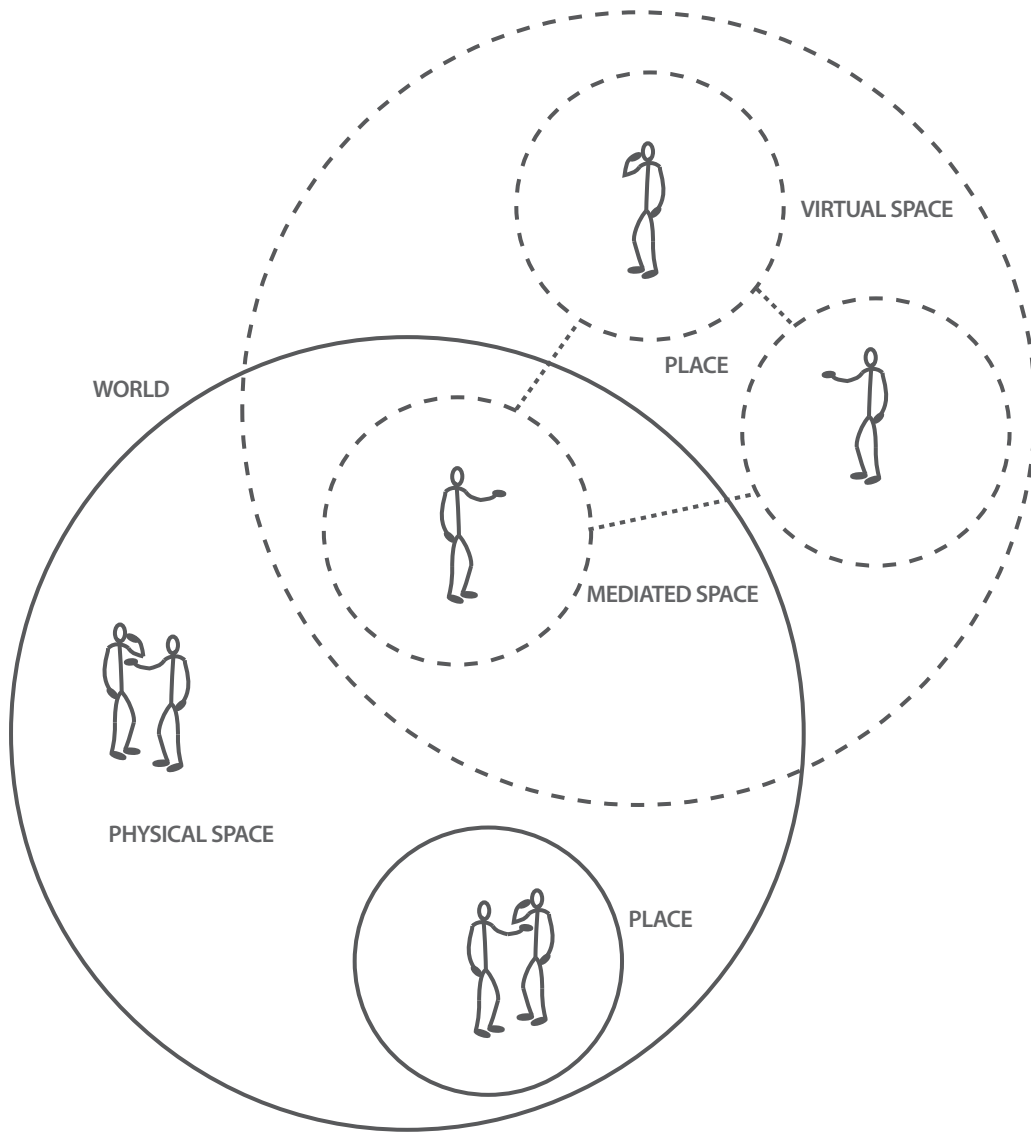
common space is shared between people that are stationed elsewhere on the planet.

As mentioned previously, Cicognani (1996) observes that there are certain attributes present in cyberspace that directly reflect the characteristics of physical space. These attributes, essential in establishing place in the physical world, are also present in cyberspace and play undifferentiated roles in establishing the sense of place. For example, like physical space, the domain in cyberspace can be formulated and structured to provide the possibility of 'dwelling' (Cicognani, 1996). This renders the otherwise unknown domain into particular recognizable properties that individuals can begin to acknowledge and have a dialogue with. The organization of spaces suggests the formation of communities, which is another vital component in creating a sense of place because communities are formed from social and cultural commonalities, resulting in a strong sense of identity and belonging to which individuals can find themselves attached to. "Communities are independent from their spatial organization, even though their development shows itself inside an 'action' space; communities can exist beyond their geographical location" (Cicognani, 1996, p. 3). Thus virtual communities in cyberspace provide a sense of place that is not so dissimilar from those that are established in the physical realm.

Position remains an all-important aspect of human consciousness. Kingwell (2008) recognizes that despite the reality that mobile communications have rendered the concept of location irrelevant, people continue to associate the mediated being in electronic space with places in physical space. "The first question most

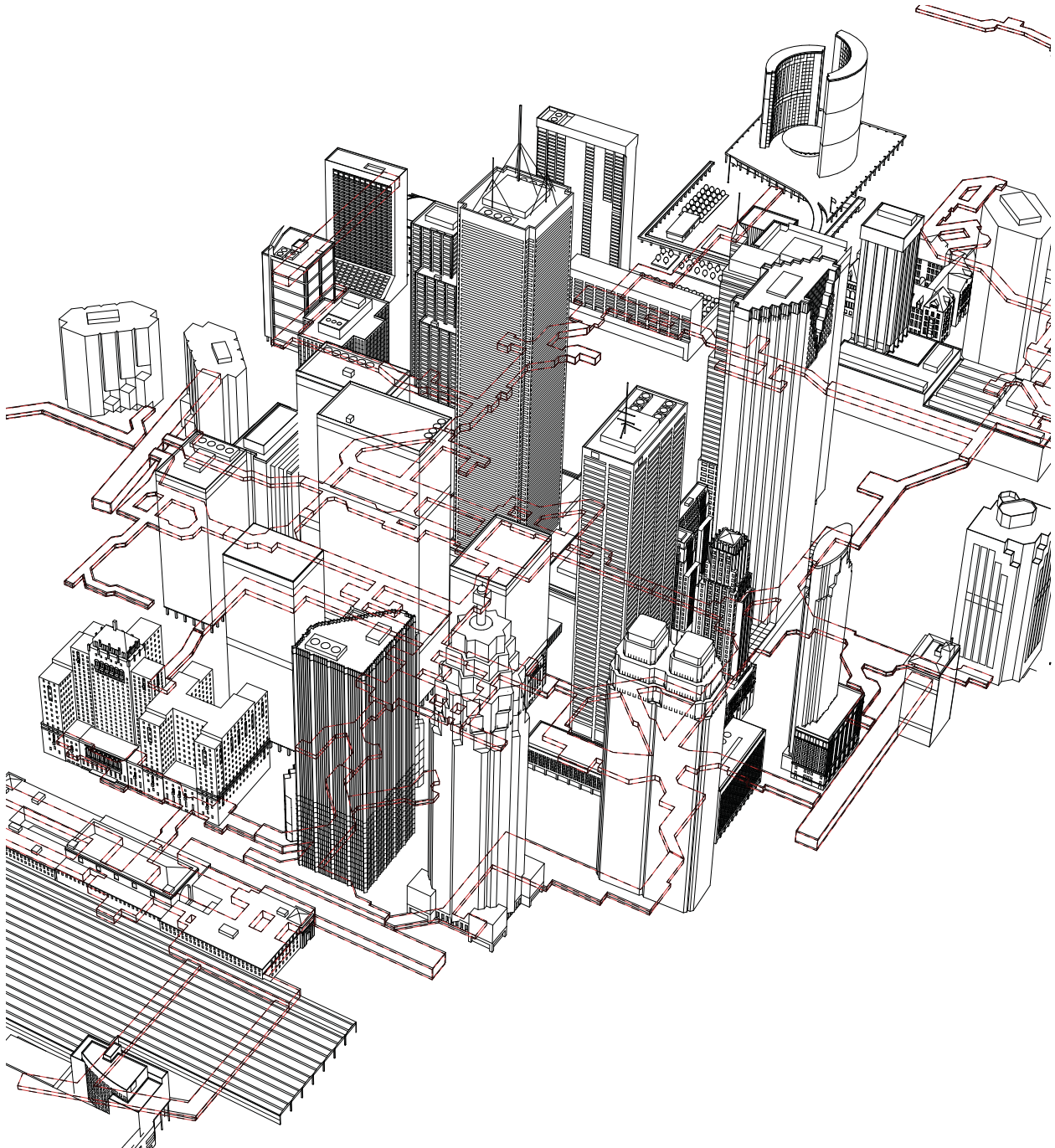
people ask of a cell-phone interlocutor is, where are you?" (Kingwell, 2008), just as we are concerned with the background information and location of the person we encounter in the virtual realm of the internet. This phenomenon can be further illustrated with the recent proliferation of Twitter, where the free social networking and 'micro-blogging' service enable users to post their status via their mobile devices where they share what they are doing and where they are in their tweets [status messages]. As the distinction between the real and the virtual continue to be blurred, the focus remains on the body and its location in real space (Allen, 2008). Castells (2007) agrees that there is a need for grounding in the physical space that we inhabit, and ultimately exist in. Despite the increase in activities in the virtual realm of the internet and the dematerialization of physical things into bits created by information and communication technologies, there remain places to access the electronic world: an interface in the physical realm to access the electronic realm. The reality is that physical space has not been replaced by cyberspace, in the sense that physical places continue to serve their purpose as locations to form our schemata because we continue to exist in the physical world.

All in all, information and communication technologies such as the internet and the mobile phone have refashioned the relationship between man and his environment; a new sense of place has emerged at the intersection of the virtual realm and physical realm in an augmented hybrid reality. Despite the changing perception of place that has been brought about by the now co-existing cyberspace, we nevertheless inhabit, and ultimately exist in physical space where there remains the need for grounding life in effective contexts. Thus, it is the role of the designer / architect to respond to this new sense of place, and revisit the function and character of the constructed environment in this digital era.



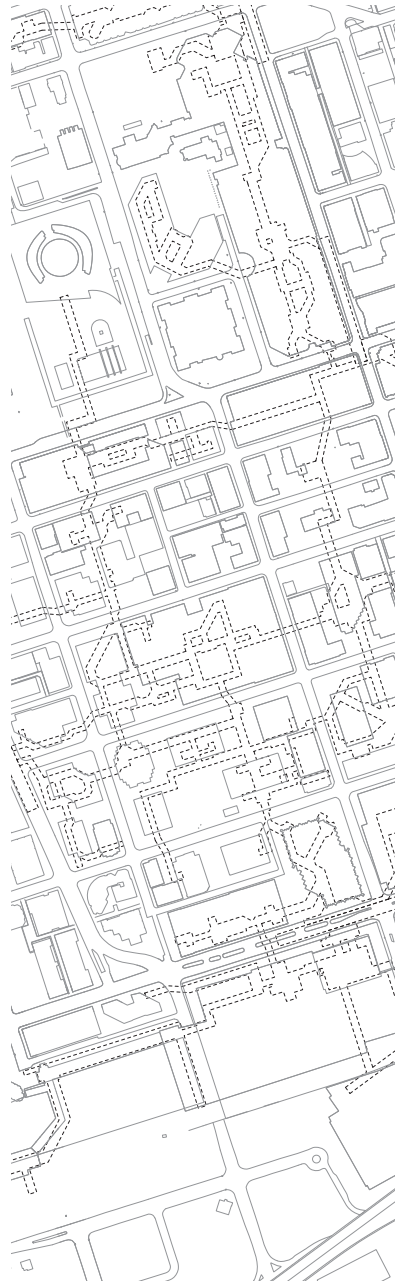
26 Sense of place present in our physical experience, mediated experience, and virtual experience

DESIGN



27 The underground PATH network in Toronto, Canada.

DESIGN EXPLORATION



28 Plan of the underground PATH network in downtown Toronto.

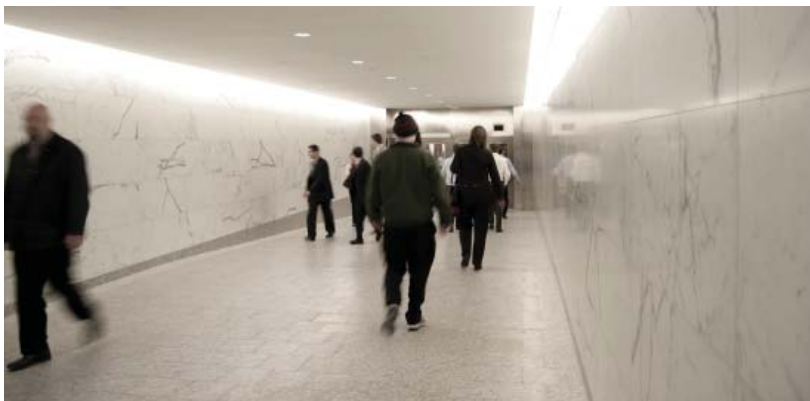
CONTEXT

Mobile technology has refashioned our relationship with one another and our engagement with the environment, and continues to do so as mobile devices become more ubiquitous. The examination of our changing sense of space and place in the thesis research has revealed the changing perception of our environment as well as new social conditions produced by the proliferation of mobile technology. As part of the design research, the thesis project tests these social and perceptual implications in theory against observation and analysis of real experiences in the physical spaces and places of the city.

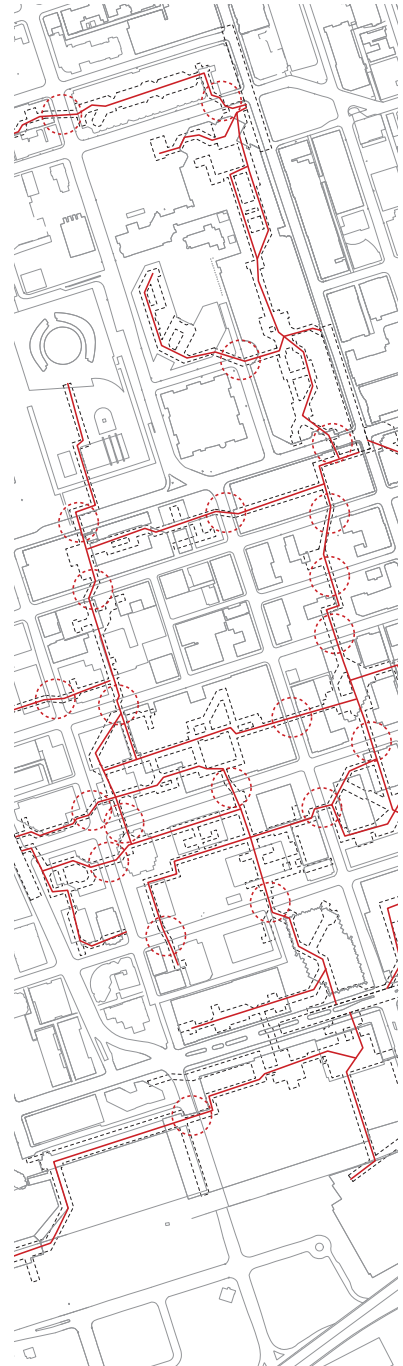
One of these implications is that mobile technology disembodies us from the direct physical experiences and engagements we have with our environment and one another. As a space that is physically disembodied from the city, the underground PATH network in downtown Toronto becomes the ideal realm for expressing and discussing some of these social and perceptual implications, and more importantly a test bed for potential architectural interventions for addressing these issues. The PATH serves as the ideal domain to explore and investigate these social and perceptual implications because of the contained attributes and finite variables it has in the underground environment. Under the controlled space, the social conditions and spatial perceptions are exaggerated and magnified, making the otherwise hidden implications more explicit and comprehensible.

SPACE OF TRANSITION

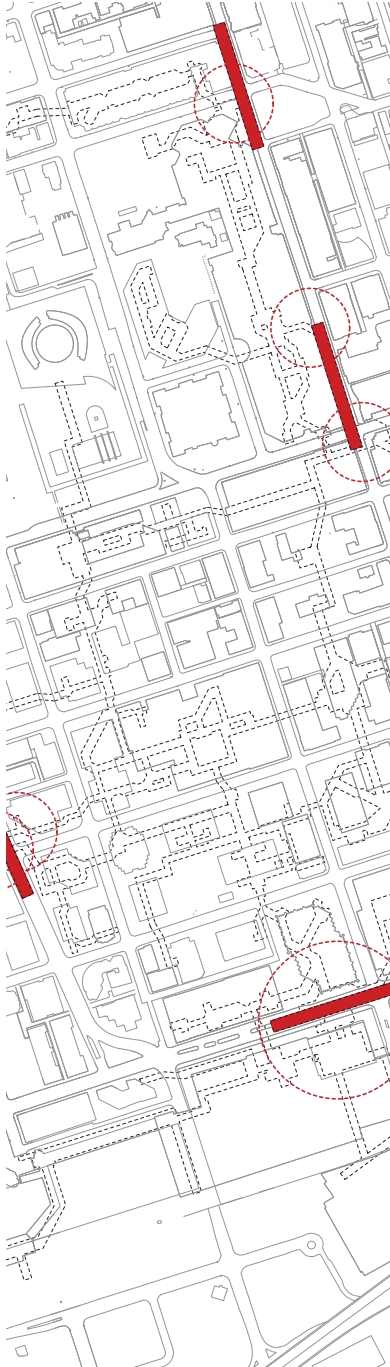
The PATH serves as the alternative pedestrian network to the streets and sidewalks above. The PATH consists of a series of underground public spaces that connect many of the office towers in the downtown core. As an absolute space of transition, commuters traverse the network of corridors to get from one point to another. What is interesting about the observation of this underground space is that little to none direct social engagement occurs there. People enter the underground network from the subway station or through one of its many access points, and traverse through the underground spaces to their work place in the building above, and vice versa. Despite the PATH being a public space, the people traversing through remain in their own private realm, talking on their cell phone or listening to their iPods while they get from one point to another; ironically, a social condition that is not so different from the streets above. The public spaces in our city are becoming more and more a space of transition as opposed to the communal spaces for gathering, as we become more disembodied as a result of the ubiquitous use of mobile technology.



29 People traversing through the underground PATH network



30 Mapping showing the underground pedestrian routes and nodes of 'engagement'



31 Junction between the PATH network and the subway network

POINTS OF DISCONNECT

The entrance to the subway station from the PATH is an interesting place because it is intersection between the transit network, the underground PATH network, and the city above. We go into a space of deprived technological connectivity when we enter the underground subway system, as we become perceptually disconnected from the streets and buildings of the city and disengaged from the digital space that we are connected to through our cell phones. When we disembark the subway we are again perceptually re-engaged with the world and reconnected to the digital space of mobile networks.

The subway car is also an interesting place to examine the social conditions that we are in. In the early 1900s, before the introduction of public transit, people were not accustomed to staring at each other without feeling obligated to speak with one another. Since then, society has accepted the convention that allows us to create our own private space to manage any awkward social situations, whether it be with music from our headphones or to simply read a book or newspaper. Ironically, we further disconnect ourselves from the environment we are in and the people around us in the already deprived space.



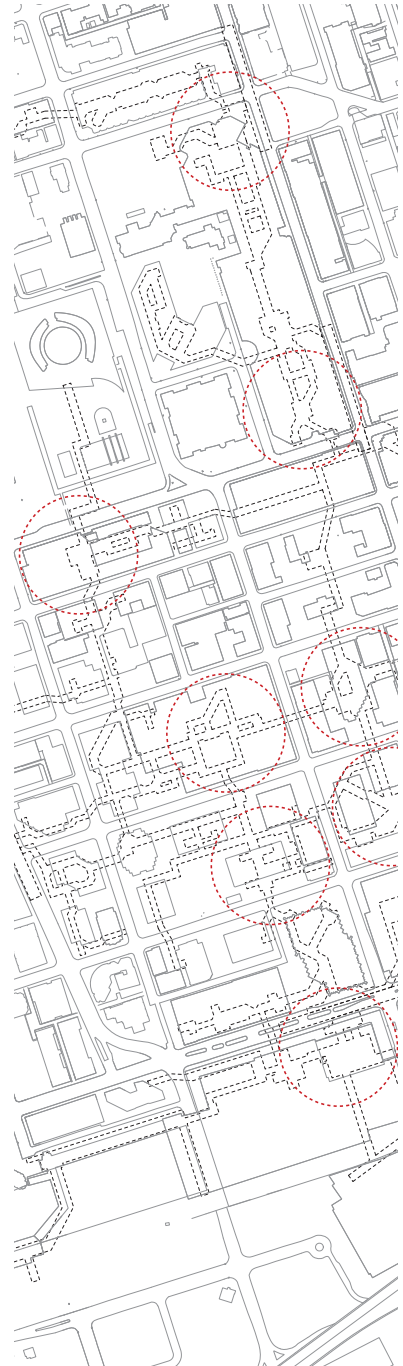
32 Entrance to Union Station subway platform

INSTANCES OF SOCIAL ENGAGEMENT

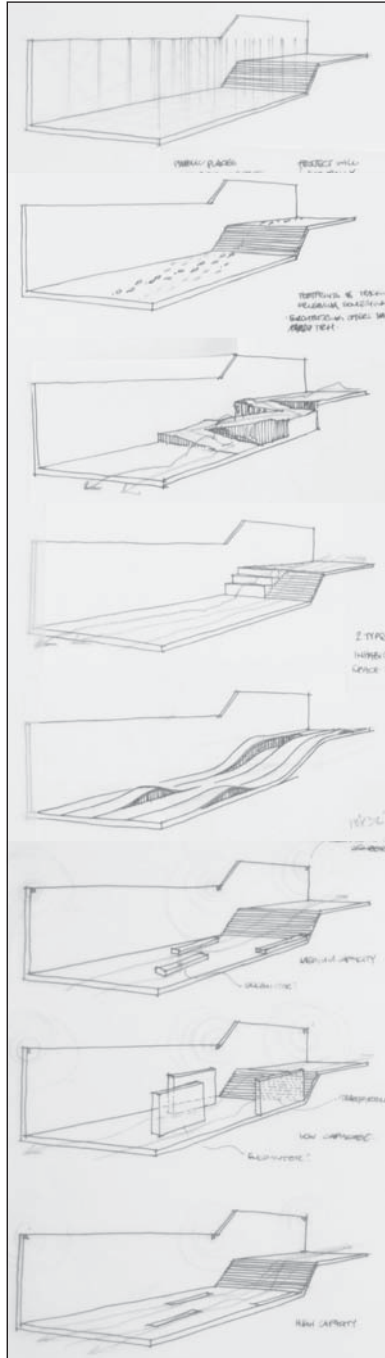
In contrast to the stark connecting corridors and tunnels of the PATH, there are communal spaces for gathering such as the food courts and shops along the PATH network. Despite these being places of social engagement, we rarely encounter and engage with the stranger in these public spaces. We either have the lunch by ourselves, or get together with people that we already know. Since the late 1990s, places of gathering have not disappeared as a result of our increasing engagement with the online social realm, as we continue to have face to face direct physical engagement in the physical world, but opportunities for encountering the stranger are becoming more infrequent and uncommon as our social condition become increasingly inward-focussed in nature. One can argue that online social networking or even mobile communication has increased social engagement between people, however, most of the applications are oriented toward maintaining contact with our already established social circle or finding a partner with similar interest.



33 Food court at Bay Adelaide Centre



34 Food courts and stores in the PATH network

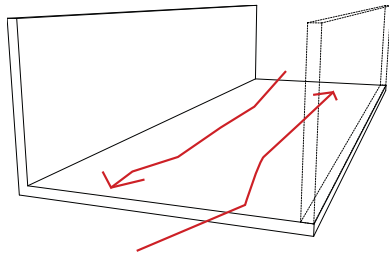


35 Preliminary design sketches

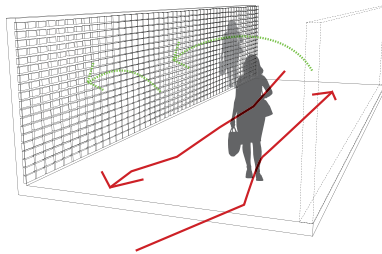
INTERVENTION

Online social networks have replaced the street as the preferred place to see, be seen, and connect. As more and more of the public realm is becoming an online virtual experience, we architects, as designers of the physical public realm, need to revisit the role of public spaces. Political theorist Hannah Arendt describes public space as the place we encounter the stranger, where we breed tolerance through encountering differences in opinion (Greenfield & Shepard, 2007). As the thesis project observed through the analysis of the underground PATH network, the social condition of encountering the stranger is becoming more infrequent and difficult. Public spaces are becoming more transitory as mere non-places that we pass through, not so dissimilar from the stark corridors of the PATH. Social networking applications and websites increase social engagement between people but they tend to orient towards connecting with people in a familiar social circle or with whom there are established common interests.

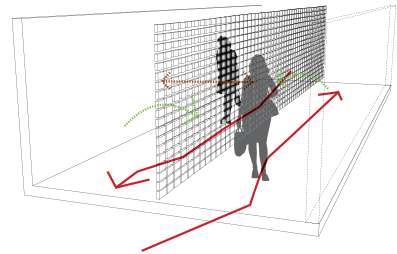
On that premise, the thesis project seeks ways in which architecture can provide opportunity to enhance, or even provoke unexpected social encounters with the stranger. Using the stark transitory space of the underground PATH network as a test bed, the thesis project tests various architectural interventions that would generate social engagement to this effect, that otherwise would not likely occur.



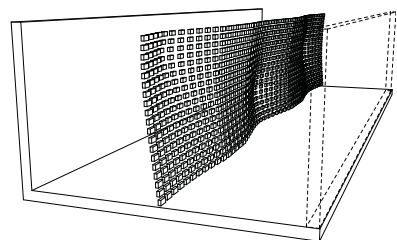
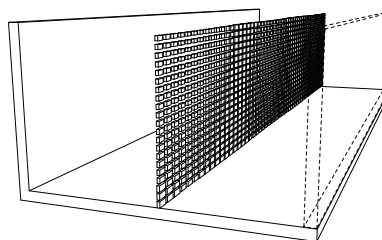
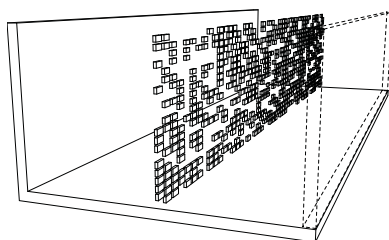
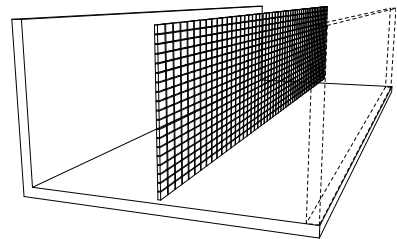
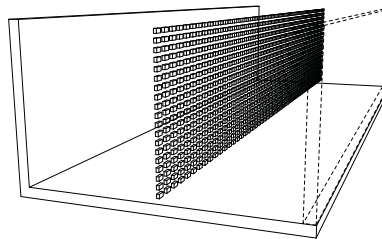
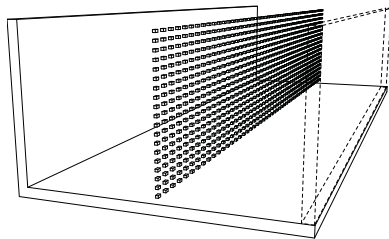
UNCONTESTED SPACE



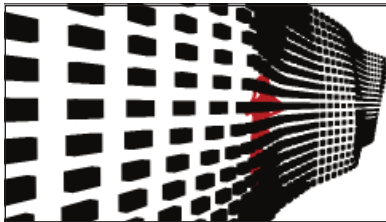
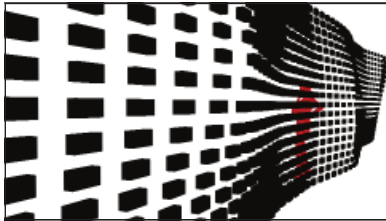
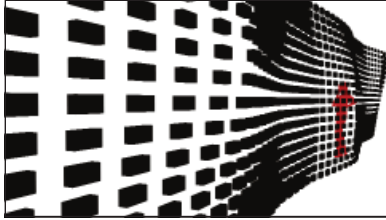
INTERACTIVE WALL



INTERACTIVE SCREEN



36 Enhancing encounter from interface as the wall to interface as the screen

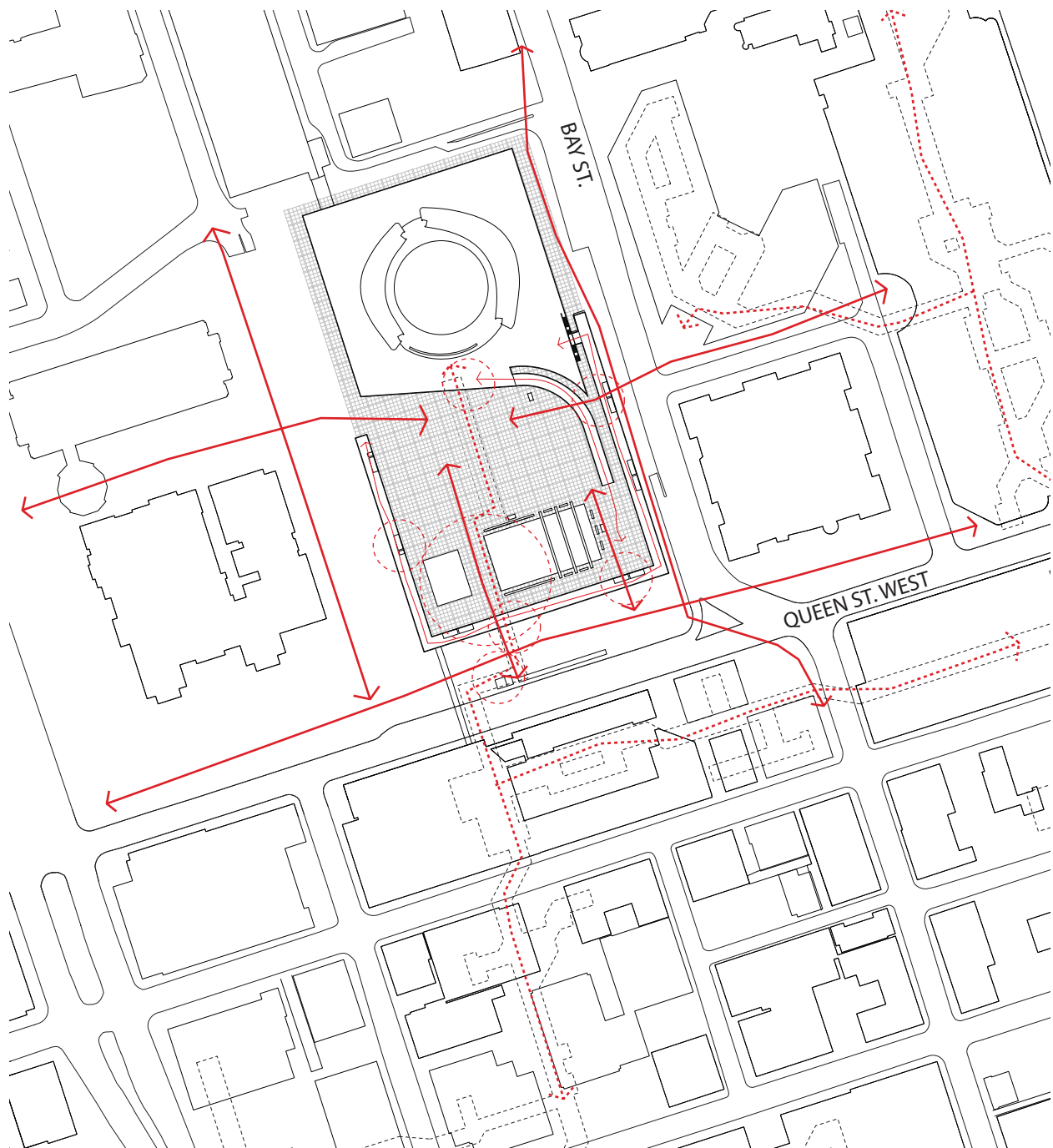


MOMENTS OF ENCOUNTER

Beginning with the wall, the design exploration seeks to find ways to create moments or instances of engagement between the occupants of the space. The goal is to make aware, to the person traversing through the space, of others that are in the same space - in hopes of triggering various levels of social encounter between the occupants. One approach is the use of interactive elements to make explicit the presence of the occupant in the space, as well as the presence of others. Interactive space, in most cases, entails embedded computation [intelligence] and a physical counterpart [kinetics] that operates within the contextual framework of human and environmental interaction (Fox & Kemp, 2009). Beginning with a wall, the surface is imagined as an interactive LED screen. Like a 'high-tech' mirror, the interactive system records the movement of pedestrians passing through the space, and projects a delayed playback on the LED screen. The occupant is transformed into a participant, becoming aware that he/she is being tracked and recorded, and is indirectly engaged with others that have traversed through the space.

To further exploit this engagement, the LED screen is imagined to be removed from the wall, bisecting the linear space of the PATH and functions literally as the 'screen' or between the paths of travel. The screen, now acting as a physical partition, divides the space and creates interference in the otherwise uncontested environment. The modulated spacing of the LED screen becomes a porous surface of apertures, allowing for various levels of filtered engagement between the people traversing through the space. The physical presence of the screen and the images projected on it, mediates and magnifies the otherwise unconscious experience of traversing through the space with others alike.

37 Encounters through the screen



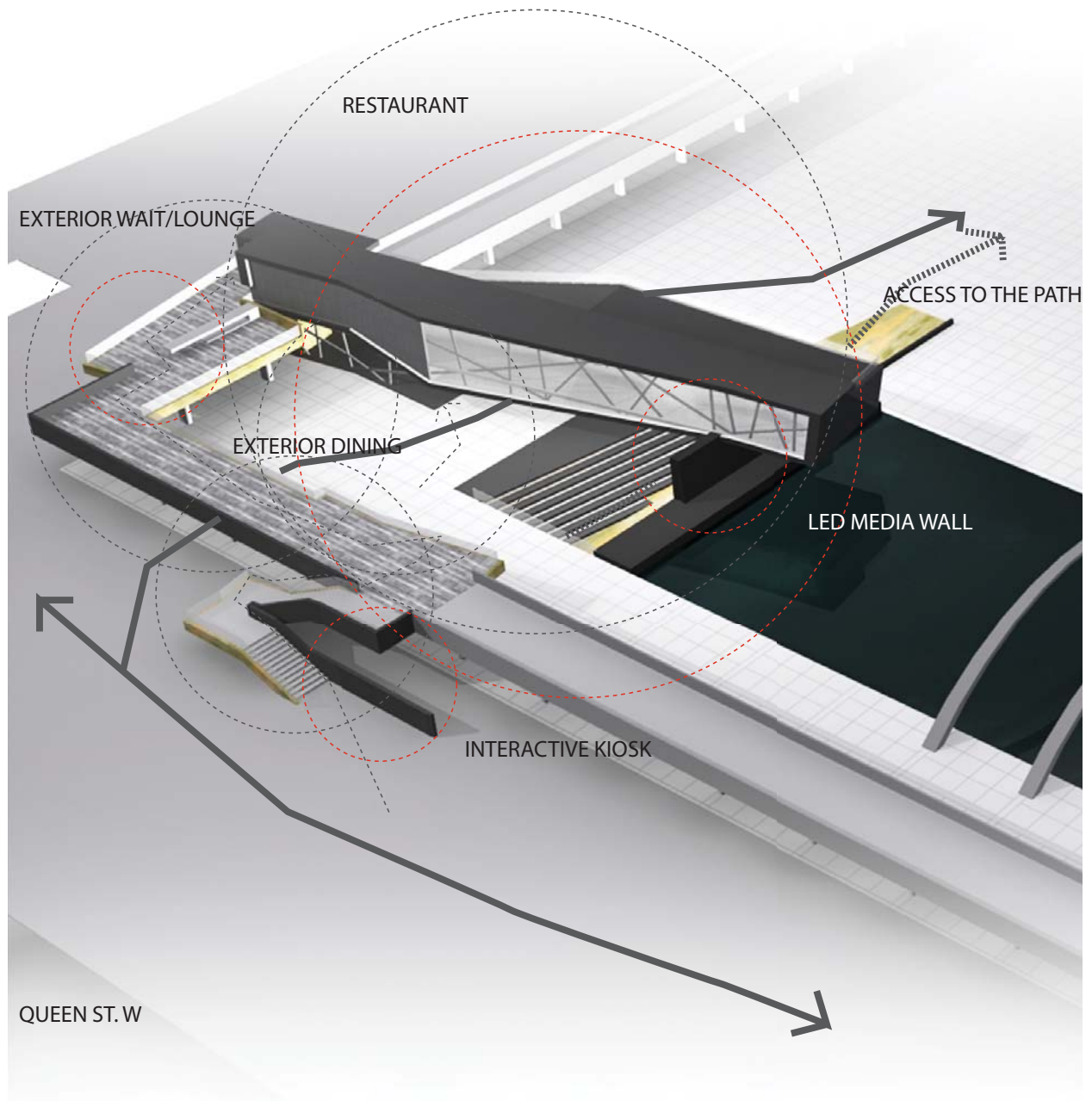
38 Concentration of pedestrian circulation in Nathan Phillips Square

DESIGN PROJECT

OVERVIEW

The observation and analysis of the underground PATH network has shown how much we are capable of being perceptually disconnected from the spaces that we are in. Disembodied from our environment, our sense of place becomes detached from the physical environment as online virtual space becomes the place to connect, see, and be seen. Despite the ever increasing social interaction we have via our mobile devices and computers, the virtual digital experience is still very much localized within physical spaces. The first question most people ask of a cell-phone interlocutor is, "where are you?" (Kingwell, 2008), as our virtual interactions continue to be localized in places we are familiar with in the physical world, where face to face interactions continue to occur and remain integral to our social condition. As demonstrated in the design exploration, architectural intervention in an uncontested space can enhance and provoke social engagement between the occupants.

The thesis project continues with that idea, and seeks ways in which architecture can provide the opportunity for unexpected encounters that otherwise would not occur in an uncontested space. As a literal extension from the disembodied space in the underground PATH network, the thesis project imagines a designed environment in Nathan Phillips Square and its connection to the PATH. Being the junction between the conceptual center of embodied social space in the city and its disembodied space, the square becomes the realm of design in the real physical public space where face to face social interaction occurs and also as the grounding for virtual experiences. The intersection of pedestrian circulation flow became an apparent starting point, where the concentration of occupants traversing



39 Restaurant at the south west corner of Nathan Phillips Square



40 John, Jill, Jane, and Joe

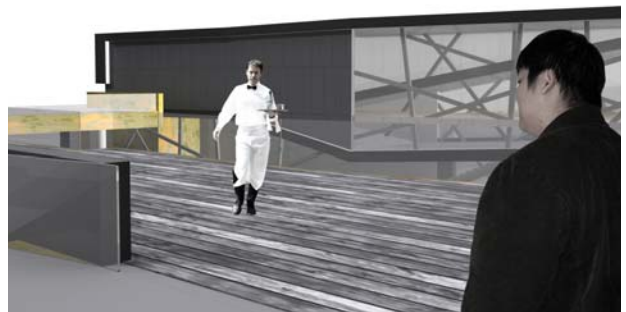
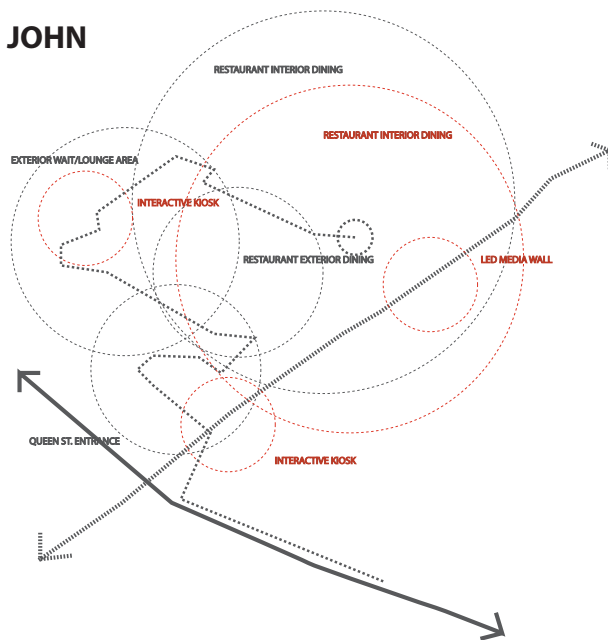
through the square crosses paths, spawning potential social interaction between the people in the public space. The program of a restaurant is also injected into the thesis project design to further illustrate how architecture along with the use of mobile technology is capable of responding to the new social conditions and their perceptual implications.

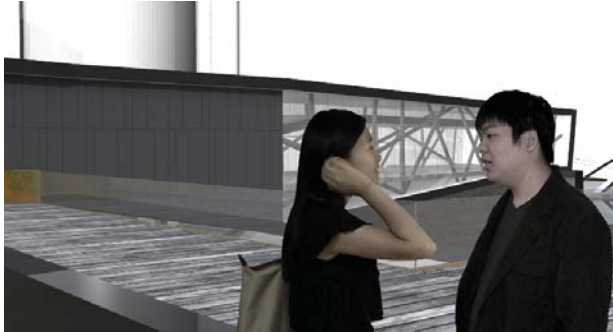
NARRATIVES OF EXPERIENCE

"[Social] space is not a thing among other things, nor a product among other products: rather, it subsumes things produced, and encompasses their interrelationships in their coexistence and simultaneity..." (Lefebvre, 1991, p. 73)

With respect to Henri Lefebvre's social model of space, the thesis project argues that space is produced by social relationships, interactions, and activities that happen within a space. Thus, through the hypothetical experiences of four people - John, Jill, Jane, and Joe, the thesis project demonstrates that architecture, along with mobile technology can enhance and provoke social encounters between the people within a designed environment. The use of narratives to illustrate the ideas is logical and consistent with the line of research on the changing perception of space and place, where our sense of place derives not from the spaces in which we inhabit and exist, but our experiences within it. The unexpected encounters offer a new level of awareness in which a new relationship is created between the participants and the environment that they are in. All in all, the designed environment creates an active participation between the occupants and with the environment and thus enhancing our experience with the space and the transformation of a space into a place.

JOHN

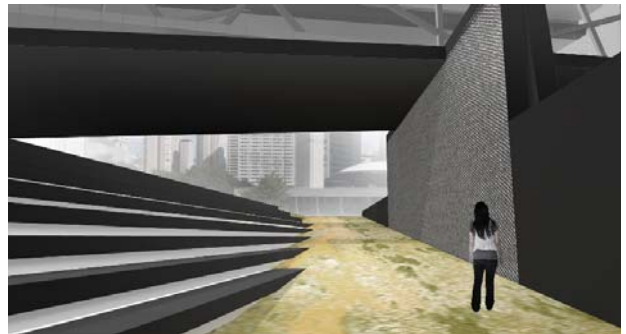
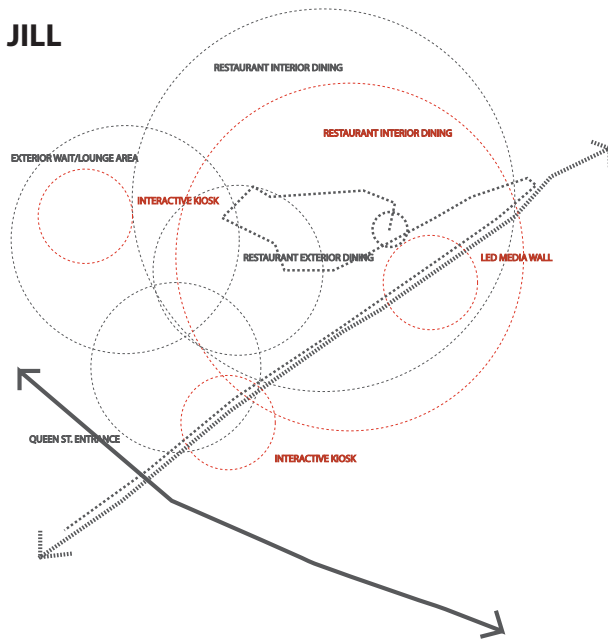


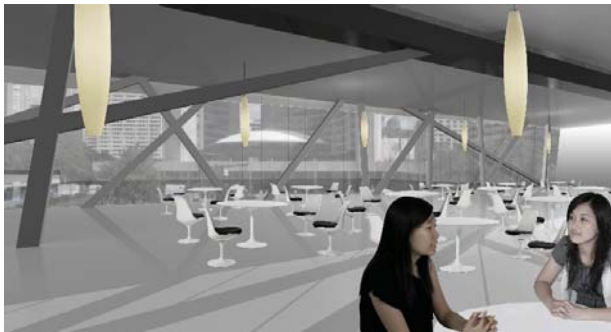
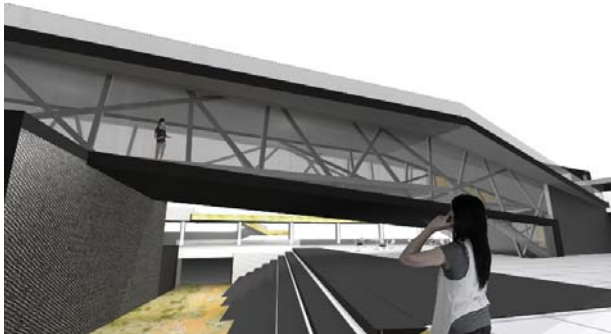


41 John's experience

John is a busy young man working in one of the office towers just east of City Hall and is a repeat patron of the restaurant. Approaching from Queen St., the restaurant signage system detects his proximity – through his RFID tagged smart phone, and greets him. The signage system, which doubles as an interactive kiosk, confirms the number of guests and the food order which John had input on the restaurant website from his office, and gives him the estimated wait time. He walks up the stairs to the exterior lounge/wait area. The waiter greets him and confirms that it is a busier than usual day, and offers him his usual drink (as recorded on the computer from his past experiences with the restaurant). While waiting in the lounge/wait area, he noticed Jane browsing through the restaurant menu on one of the menu displays in the area and offers some suggestions to her. His smart phone alerts him that the table is ready. He enters the restaurant as the restaurant staff greets him and guides him to the table. Since the menu has been picked through the restaurant's website, the food arrives quickly.

JILL

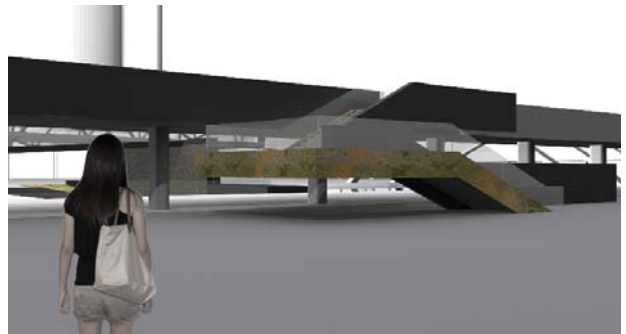
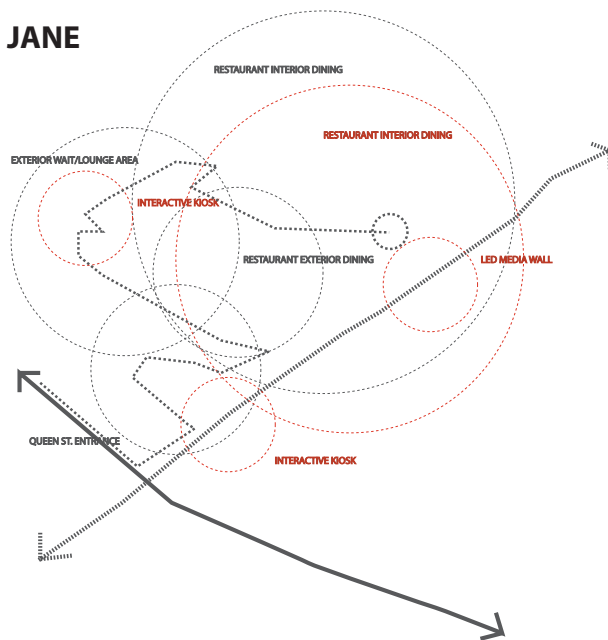


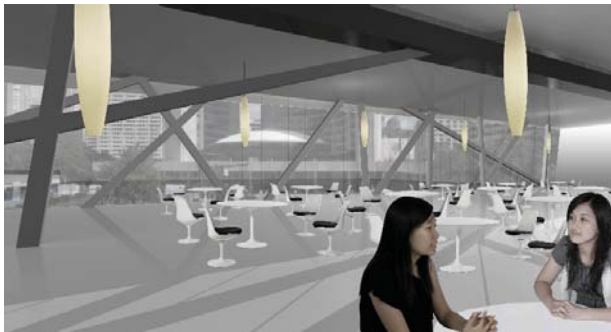


Jill is a young woman working in one of the office towers just south of the City Hall. She has planned to meet with her long time friend Jane who works nearby, for lunch. The path connection to the City Hall makes it an easy walk from her office. Exiting the path she notices the LED media wall beside her as she walks up the ramp. The LED media wall has sensors that detect her identity on the RFID tag in her smart phone. It projects a series of images that reflect her, not so different to her profile on social networking sites in which she can control what she displays to the public. On this particular day, she has chosen to display her favourite hockey team and her pet. Coincidentally, a stranger walking into the path from city hall is also showing her favourite hockey team. The two strike up a conversation. She continues to walk up the ramp and hears the noise of the ground floor patio of the restaurant, hearing the chatter, sound of knives and forks hitting the ceramic plates, she turns around and heads towards the restaurant. She calls her friend Jane on her cell phone to see if she has arrived yet. Looking up she notices Jane is already inside the restaurant and is waving to her. Noticing the stairs, she finds the entrance around the corner. She locates her friend easily on the open restaurant floor and enjoys a nice lunch with her friend.

42 Jill's experience

JANE

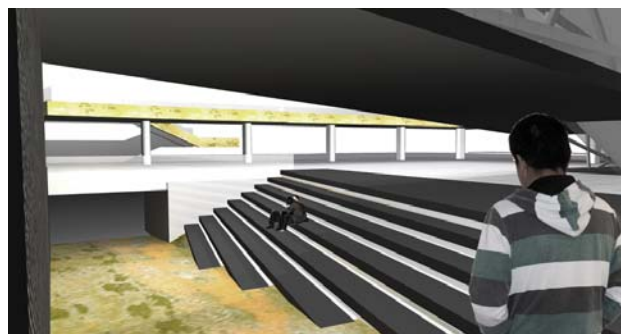
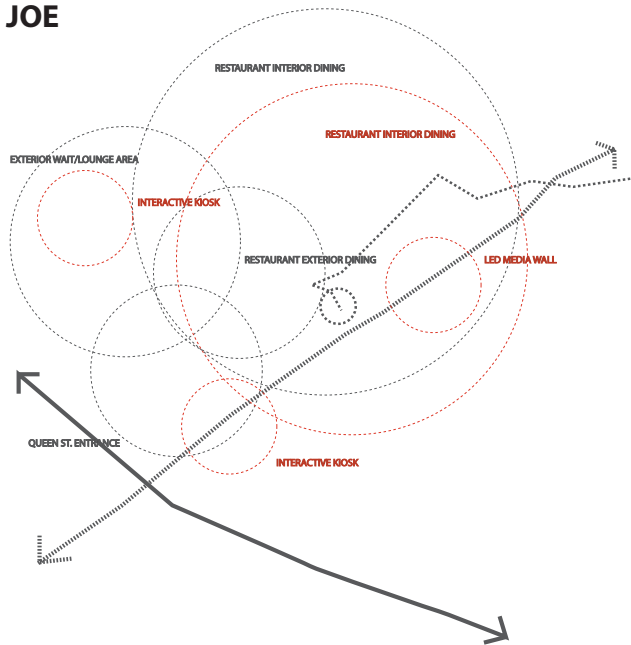


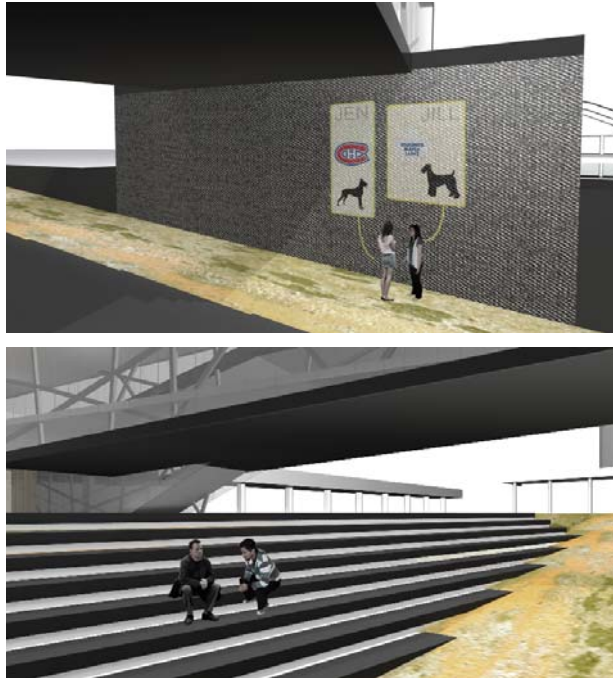


Jane, who works just west of the City Hall on Queen St., is meeting her friend Jill for lunch. Approaching the restaurant from Queen St., she notices the stairs and the interactive kiosk. First time going to this restaurant, Jane reserves a table for two at the interactive kiosk. The signage system gives her the estimated wait time and directs her to the exterior lounge/wait area on the raised walkway. Being new to this restaurant, she browses through the restaurant's menu on one of the video displays in the lounge/wait area, and gets some suggestions from John, who is a repeat patron of the restaurant. The restaurant staff easily identifies her and greets her in the exterior lounge/wait area because her image was captured at the interactive kiosk. The restaurant staff seats her as she waits for her friend Jill to arrive. She receives a call from Jill, saying that she is right outside and should be up shortly. Jane enjoys a nice lunch with her friend.

43 Jane's experience

JOE





44 Joe's experience

Joe is a student from a nearby university. He decides he'll have his lunch outdoors, taking a break from his studies. Entering the square from the north, he accesses his smart phone and opens a mobile application (i.e. a Google or a spatially located augmented reality application) to what points of interest are located and events are happening around the area. The application reveals a short performance later that evening, the entrance to the PATH, restaurant in the square, and amongst these other interesting happenings. The application shows that there is a LED media wall with some seating underneath the restaurant and this seems like a good place to eat his lunch. Arriving at the steps, he sees others that are also having their lunch in the shade below the restaurant. While having his lunch, he enjoys the media display triggered by people walking up and down the ramp. Sitting there he can only imagine what their discussion is about, and finds it quite entertaining. Striking a conversation with another person relaxing on the steps, Joe shares what he thinks is being discussed with a stranger who is also having lunch on the steps.

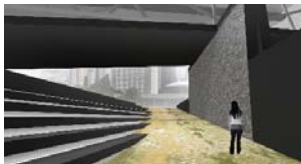
JOHN



JANE

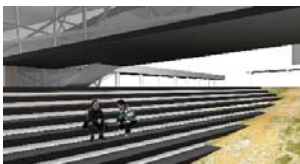


JILL



JOE





45 Instances of unexpected encounters between occupants of the restaurant and its adjacent spaces

PROVOKING + ENHANCING ENCOUNTERS

The narratives illustrate how architecture along with mobile technology can create moments and instances of social encounters that would not likely have otherwise happened in the uncontested space. Joe may not have had a discussion with the stranger if it was not for the media display triggered by Jill and her counterpart. Likewise, Jill would not have entered into a conversation if not for the LED media wall displaying what is otherwise hidden as she walks up the ramp. The intention of the thesis project design is to show that traditional architectural elements, working with mobile technology, can increase and create opportunity for such encounters in an augmented experience that otherwise would not occur as one traverses through space.

The level of social engagement produced also varies in this prototypical environment, where the social encounters range from direct face to face encounters in direct conversations, to mediated engagement through space and time. John's encounter with Jane in the exterior wait/lounge area on the raised walkway is a direct social interaction, as opposed to Joe's indirect encounter with Jill where their engagement happens through the mediation of the LED screen. Nevertheless, opportunity for social engagement is produced through the integration of architecture and mobile technology that otherwise would not very likely occur in the uncontested space.



46 Moments of encounter
between occupants

CASE STUDY

UNDERTAKING ACQUISITION CHRONICLES OF OUR TIME

Maggie Greyson, Christine Lieu, Phoebe Lo
Toronto, Canada

Room 202 was an exhibition of the Archival Library of Found Treasures, an ongoing collection of unique items and trinkets that has been contributed from various people in Toronto. Visitors to the exhibition contribute a personal item of their own, and in return selects an item to take home with them. Each item is endowed with a special meaning or story which is written on a tag that is attached to the item, and placed in a transparent glass jar for display until it is picked up by another visitor to the exhibition.

The exhibition is participatory in nature, in the sense that it is an ever changing experience as strangers exchange items with one another. The engagement between the strangers is both direct and indirect in the sense that personal experience and stories are shared and past on but at the same time, the parties in the exchange does not meet face to face in a direct encounter. The physical space of the exhibition merely becomes the place rather than the vehicle in where strangers encounter one another.

In many ways, architecture has that same relationship with mobile technology as it becomes the place in the physical realm to facilitate the direct and indirect social engagement that occurs.



47 Exhibition Room 202 at the Gladstone Hotel, Toronto, 2010

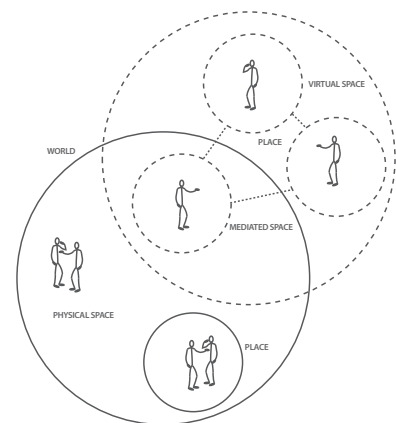
NEGOTIATING SPACE

Architects, as designers of the physical realm, can no longer imagine space without considering the virtual space that co-exists with the physical space in which we ultimately live, work, and play in. Blurring the lines between direct, mediated, and virtual experiences, we create our social places beyond the solely physical spatial circumstances that are around us. In addition to the spatial definers of walls, windows, and doors, other logics come into play in organizing space, time, and boundaries around the body. For instance, we produce our own private space in a public space by putting on headphones or having a “private” conversation on our cell phone. We augment our physical experience with layers of information and media, creating an experience that is neither entirely physical or virtual, but becomes a hybrid of both augmented experience.

The advancement in mobile technology continues to transform our experiences in the physical realm. Applications such as Wikitude – a Google augmented reality application, enhances both our visual field and consciousness. We no longer explore space through only the direct physical engagement with the environment but also through other experiences. Orientating a device at a building may reveal more than just the façade itself, but also things and happenings beyond the direct physical appearance. “Our cities do not disappear in the virtual networks, but they are transformed by the interface between electronic communication and physical interaction, by the combination of networks and places” (Castells, 2007, p. 445). Thus the thesis project explores ways in which mobile technology can play a part in shaping the experience in the public space and the important role that architecture can actively play in this experience.



48 Augmented experiences



49 Augmented experience as the negotiation between physical space and virtual space



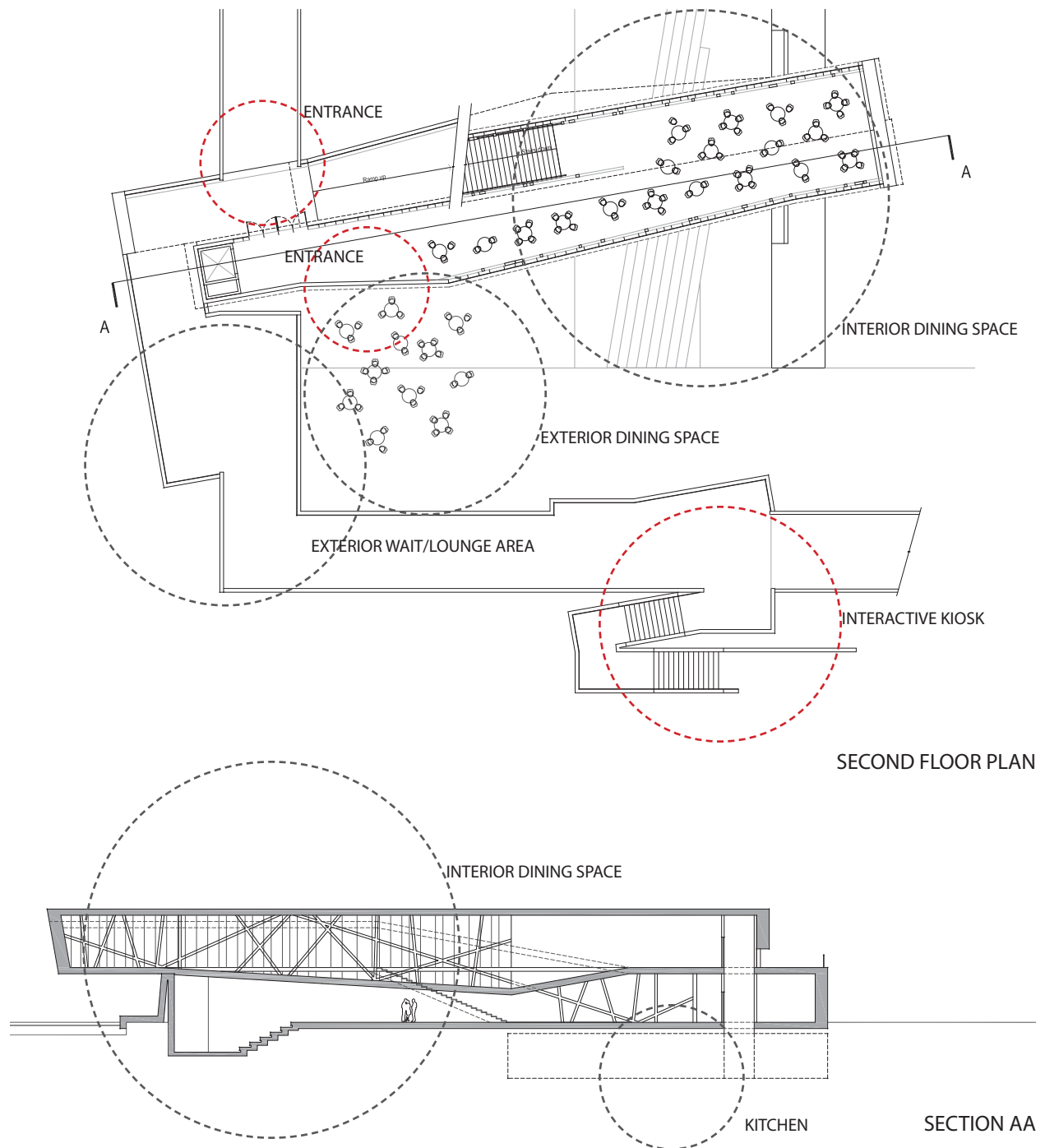
50 Sensors and Interfaces as the medium between physical space and its virtual counterpart

INPUT + OUTPUT

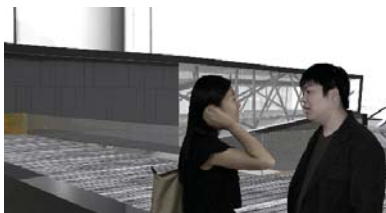
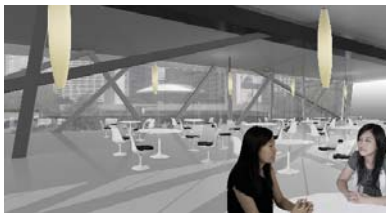
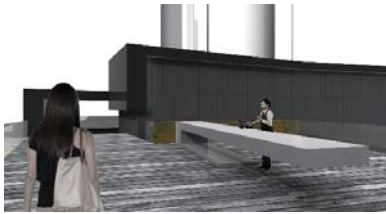
In the augmented space, we negotiate our space between old paradigms of what constitutes the city, bricks and mortar, as well as new parameters created by mobile technology, a layering of direct, mediated, and virtual experiences. Thus, a key part to the future of architectural design is to manifest the metaphysical information into the architects' realm of design in the physical space. This can vary from direct materialization of the invisible forces in virtual space, to a more subtle indirect use of information, to informing space. The interactive kiosk and the LED media wall are examples of the former, where information is directly manifested in the physical space as visible images, and therefore becomes perceivable to the occupants of the space.

The output of virtual information into real physical architectural space also allows for a more dynamic environment that reacts in real time to its participants. Like the LED media wall at the exit of the PATH, the real time response on the wall as Jill walks by, triggers an experience that is new and different relative to the other people that are also passing by. The challenge for architecture is to design these technological engagements not as mere glorified door openers with the embedded technology but to create an interactive environment that would form new relationships between the participant and the constructed environment, and more importantly, create a new relationship between the participants.

But what is even more interesting are the implications of the availability of spatialized 'public' information that is otherwise invisible, such as the number of times a person has passed through this space, the number of people that are in a given space, and/



51 Second floor plan and section of the restaurant.



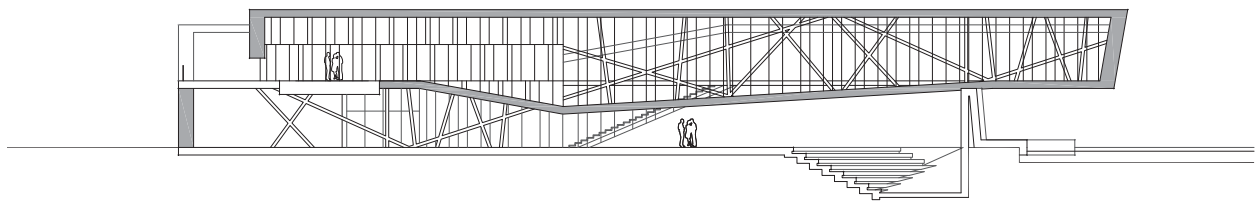
52 Reprogramming function and reformatting spatial organization

or the kind of person that is passing through the space. Like the restaurant and its interactive kiosk, these interfaces and sensors can begin to reprogram traditional functions of architectural spaces.

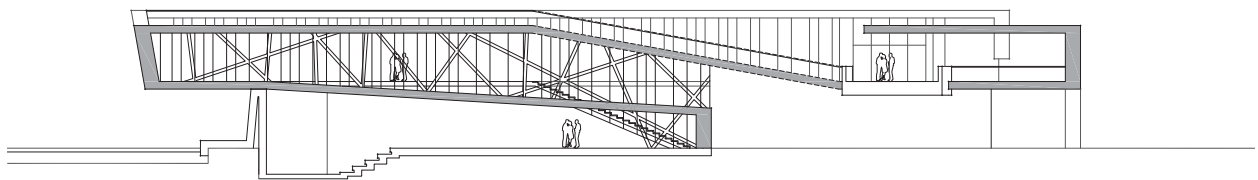
REPROGRAMMING

The collective use of sensors and interfaces has the ability to transform traditional architectural functions and program as boundaries and time are reformulated in an augmented space. The thesis project design demonstrates some of these changes that are made possible and become viable through of integration of architecture and mobile technology. For instance, the restaurant kitchen is entirely removed and hidden from ground floor and second floor to allow for a more open and permeability of access within the restaurant. Food order is recorded by the waiter on their mobile devices and is sent immediately to the kitchen below grade. This is not so different from the consoles that are used now but time and distance is being further collapsed, allowing for the flexibility in the physical layout of the restaurant.

In this hypothetical restaurant, the bill for the food and drinks are expensed directly through your phone to your bank account. As a result, there need not to be one exit to control the customers going in and out of the dining space. The automatic payment system allows for multiple entrances to the interior dining space, or no entrances at all – boundary-less like the exterior dining area on the ground floor. The personal RFID tag also identifies each customer, resulting in a more flexible and interchangeable seating arrangement as the restaurant is no longer organized with the table arrangements.



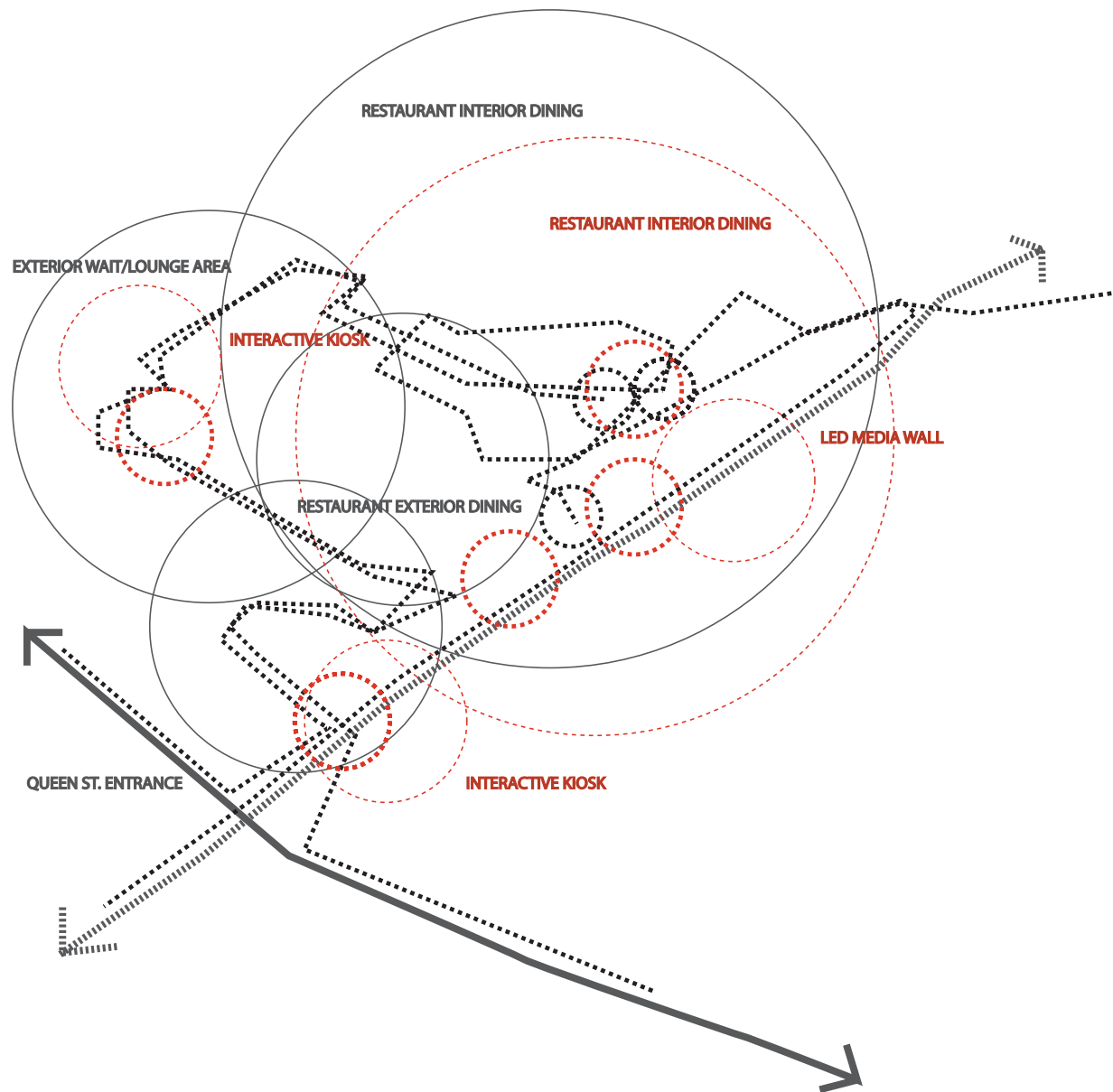
SOUTH ELEVATION



NORTH ELEVATION

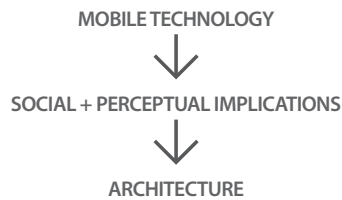
53 Elevations of the restaurant.

CONCLUSION



54 Provoking and enhancing social encounter in the augmented space

NEGOTIATING A SOCIAL REALM



55 Architecture's response to the proliferation of mobile technology through its social and perceptual implications

The proliferation of mobile technologies has transformed the way we live, work, and play in our city, and will continue to do so as we become increasingly dependent on our cellular phones and mobile devices in our everyday activities. Bridging distance and collapsing time, mobile technology has provided alternative means by which we communicate with one another, as a result refashioning our relationship with one another. Aside from the social implications, there are also perceptual implications that are prompted by the ubiquity of mobile technology. The use of cellular phones and mobile devices augments our sense of place by allowing us to become dissociated from our immediate physical environment. We are no longer connected to any single location or scene, but to multiple relations and affiliations in the virtual realm.

Architects are mainly absent from this discussion and technologist tend to resort to installations and mobile applications in an already existing architectural topography. The apparent disjunction became the starting point of this thesis, where the intention is to seek more meaningful relationships between mobile technology and architecture. The thesis proposes that the design of architecture should respond to the reality of ubiquitous mobile technology through the social and perceptual implications brought about by these technologies, as opposed to merely a superficial application of the technology to architecture.

By investigating the changing sense of space and place, the thesis research reveals that space is no longer perceived only through direct experience in the physical realm, as it also encompasses other invisible layers of information and experience in virtual space. Space is simultaneously and continuously negotiated

between the physical and the virtual, and is perceived through the augmented engagement and experiences within both realms. Online social networks have largely replaced the street as the preferred place to see, be seen, and connect, and as a result the public realm is increasingly experienced as a total online virtual experience. This poses a crisis for architecture as its primary realm of design is in the physical space, which is no longer the only place for social interaction and engagement.

The observation and analysis of the experiences in the underground PATH network brings these social and perceptual implications into actuality and are made explicit as real experiences that are perceivable. As a space that exists in disembodiment to the city, the underground PATH network illustrates the stark social condition that is present in our public spaces. Places of gathering have not disappeared as a result of our increasingly online social realm as we continue to have face to face direct engagement in the physical world, but opportunities for encountering the stranger are becoming more infrequent and uncommon as our social condition becomes increasingly inward in nature. Despite mobile technology's ability to increase social engagement between people, most of the interactions through the virtual realm are oriented towards maintaining contact with our already established social circle.

On that premise, the thesis design project argues that architecture has the ability to provide opportunities for enhancing, or even provoking unexpected social encounters between strangers in the physical public space. Public spaces in the physical realm can retain the important role of public social engagement, but furthermore, architecture can actively trigger moments and

instances of engagement between the occupants of the space that otherwise would not occur in an uncontested public space. Through a designed environment in Nathan Phillips Square and its connection to the underground PATH network, the thesis design has demonstrated ways in which architecture, along with mobile communication technology, can critically augment our experience in the public space and create opportunities for social encounters that is distinct from virtual encounters.

The thesis design project also illustrates the functional relationship between mobile technology and architecture, and its ability to generate an augmented environment that further provokes social engagement and encounters. As shown in the design of the restaurant, space is no longer imagined without the virtual space that co-exists with the physical space we ultimately live, work and play in. Blurring the lines between direct, mediated, and virtual experiences - space is designed beyond the physical spatial circumstances that once governed boundaries, transparencies, and accesses. Utilizing mobile technology as a tool for organizing space, functions and programs are reformulated, giving more options and flexibility from the limits of physical spatiality.

All in all, the thesis seeks to explore a more purposeful relationship between mobile technology and architecture. By revisiting the role of architecture in public spaces in the digital era, the thesis has proved that architecture can better respond to the proliferation of mobile technology through its social and perceptual implications. Ultimately, architecture has always been, and is always about the social – the interaction of people in the places we live, work, and play in the city. Mobile technology has changed the way we communicate with one another and the way we perceive

the spaces we ultimately exist in. By addressing the social and perceptual implications, architecture can critically respond to the changing social condition and perception brought about by the ubiquity of mobile technology.

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