

The Nature of Non-Physical Space

Or how I learned to love cyberspace wherever it may be

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More designers are concerned with the occupation of the virtual world, through immersive techniques, for example, than in using it as a means for conceptualising and theorising architectural space.

The paper examines how architects think about space and how our consideration of non-physical space might assist in spatial theory and in teaching. It also considers cyberspace fiction both in writing and film to see how it might help us think about space in a more liberating way. Architects and architectural teaching tends to focus on space as an element of construction rather than a theoretical proposition. By discussing imaginary spaces in greater depth we could encourage students to think about space and spatial concepts in a less rigid way.

In particular the paper addresses the issues of interaction and transactions in these environments and how information is represented and accessed in an apparently three-dimensional manner. In his book 'Snow Crash', Neil Stephenson deals with many ideas concerning not only architectural space but also universal space and its organisation in space and time. He uses metaphor in his depiction of the ultimate in information gathering and management. These are compelling ways in which to communicate ideas about three-dimensional thinking, and information collection and management to students of architecture as well as helping architects with the theory and visualisation of non-physical space.

Keywords: *space: virtual reality; cyberspace; film; literature.*

Notions of space

"Je suis l'espace ou je suis" (Bachelard, 1964)

Space of architecture

The act of entering the holocaust tower is a compelling introduction to the spatial experience to follow, as the heavy steel door closes with a dull thud and with a dreadful sense of finality. The temperature falls at least ten degrees and the astringent smell of raw concrete assails the nostrils. The feeling of entombment is overwhelming. Sound from the street is muffled and attenuated by its torturous passage through the small slit high-up in the acute-angled junction between two

of the walls. Only then does vision takes over. The interior is difficult to discern in the gloom, with the only light entering through the same opening as the sound. The space is pentagonal in plan and very high - probably nine or ten metres. It is one of those intense experiences that architecture occasionally affords us. The space affects its occupants profoundly.

In the Jewish Museum Libeskind's concept is redolent with symbolism and deals with ideas of emptiness and the invisible. As part of this expression of the disappearance of Jewish culture in the city Libeskind located six voids within the body of his building. Only four of these can be physically

occupied, the remaining two may be contemplated from without. This emptiness, the empty rooms are symbols of absence and are described by Libeskind as voided voids. (Schneider, B.: 1999)

The architect uses space as a powerful element in its own right both symbolically and physically, as a way of forcing us to contemplate its presence (or absence) and its ability to profoundly affect the senses.

The idea of space

“Space is more an idea than a delineated concept. Try to put it into words and you lose it.”
(Hertzberger, 2000)

Aristotle thought of space as a container of things, and visualised it as a reducing series of envelopes. Until the nineteenth century, treatise on architecture restricted themselves to the physical elements of buildings and their formal justifications. It was not until the nineteenth century that space was considered in its own right, when two German philosophers, Hegel and Schelling, elaborated on ideas relating to architecture and space.

For many architects it is convenient and expedient to consider space as yet another element of architecture to be moulded and shaped in the same way as stone, brick or concrete. You cannot feel or see it but it is there and the architect can manipulate it. Charles Moore reinforces this view. “...the space of architects is not quite like that of philosophers, nor of musicians...architect’s space is the stuff of which architecture is made”. (Moore, C and Lyndon, D, 1994)

Bernard Tschumi, however, rejects what he sees as a simplistic view of space that treats it as a ‘three-dimensional lump of matter. He is concerned with a paradox - “the impossibility of questioning the nature of space whilst at the same time making or experiencing a real space. Architecture constitutes the reality of experience while this reality gets in the way of the overall vision. Architecture constitutes the abstraction of absolute truth, while this very truth gets in the way of feeling.” (Tschumi, B, 1990)

Tschumi addresses the recurrent theme in the twentieth century discussion of space that is

concerned with the purely sensory approach to the understanding and appreciation of space. He contrasts this with ideas that echo the work of Oscar Schlemmer at the Bauhaus in the nineteen thirties where space was not only the medium of experience but also the materialisation of theory.

Hertzberger discusses space at a number of different levels but he begins by talking about ‘the idea of space’. His view accords with Tschumi in some respects, particularly when he considers its elusive nature and the difficulties inherent in trying to define or describe it. His language, though, is more poetic than Tschumi’s, and he believes that “space and certainty are strangers”. He continues, “The idea of space stands for everything that widens or removes existing limitations and for everything that opens up more possibilities, and is thus the opposite of hermetic, oppressing, awkward, shut up and divided up into drawers and partitions, sorted, established, predetermined and immutable, shut-in, made certain”. (Hertzberger, H, 2000) Like Libeskind, he understands the potent relationships between space and freedom, and space and emptiness, absence and desolation.

In spite of this, most architecture is described in terms of form rather than space, and many architects treat it as a by-product of their manipulation of form. In schools of architecture we discuss space and we devise ways to contain and define it in a quantifiable way. We then record its containment and communicate the results using physical techniques. These techniques are understood and convenient but do not accommodate many of its more spiritual, arcane or poetic qualities. Would it be far better if we abandoned this practical view of space and dealt with it in a more abstract way?

Space and mind

“Isidora, therefore, is the city of his dreams: with one difference. The dreamed of city contained him as a young man; he arrives in Isidora in his old age. In the square is there is the wall where the old men sit and watch the young go by; he is seated in a row with them. Desires are already memories.” (Calvino, I, 1972)

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We enter virtual worlds when we daydream, read a story or listen to music. Many social or personal situations require us to imagine a space that will never be physically realised. We do it automatically without any complex or elaborate preamble or sets of rules. When we close our eyes the world we inhabit changes and is informed by different data. We all require a fantasy world to inhabit occasionally.

Religion requires the devout to consider the existence of virtual domains that challenge the human concept of space and time. Concepts of heaven and hell force us to deal with conflicting notions of scale, capacity and occupation of space.

Drugs have long been used to enable the habitation of virtual worlds. Thomas de Quincey describes his opium-induced exploration of imaginary architectural landscapes. "Creeping along the sides of the walls, you perceived a staircase; and upon it, groping his way upwards, was Piranesi himself: follow the stairs a little further and you perceive it come to a sudden, abrupt termination, without any balustrade, and allowing no step onwards to him who had reached the extremity, except into the depths below". (De Quincey, T, 1822) Was he anticipating a virtual world in which the visitor could interact with the originator of the space?

Digital mediations of space

Virtual spaces

"The sky above the port was the color of television, tuned to a dead channel.... Cyberspace, a consensual hallucination experienced daily by billions of legitimate operators, in every nation.... A graphic representation of data abstracted from the banks of every computer in the human system. Unthinkable complexity. Lines of light ranged in the nonspace of the mind, clusters and constellations of data. Like city lights, receding...."
(Gibson, W, 1984)

Electronically-delineated imaginary domains have existed ever since human beings started using electrical signals to communicate with each other.

Binary-based distance communication using the Morse code was established in the first half of the nineteenth century. The early telegraph system expanded rapidly into national and then international networks. Analogue transmissions and soon after, wireless broadcasting established the basis for the communication systems of the late twentieth-century. Satellite-based systems reinforced the now global network.

When Gibson wrote *Neuromancer* the internet was still only the domain of the initiated, text-based and difficult to access. The World Wide Web had not yet been born. He represented the effect of the global movement of binary information as a multi-dimensional space somewhere just beyond the confines of the hardware and the grasp of our intellect. He called it Cyberspace.

It is a seductive concept for architects partly because it is vaguely delineated, and more of an idea than a clearly defined or understood chunk of something. Everyone has their own image of what cyberspace is. In the way it is used and depicted it engenders and enables a sense of freedom that Hertzberger talks about and an environment in which anything is possible.

More importantly, cyberspace is free of the political, cultural and economic constraints of the real world and has similarities to the free-zones and free-spaces proposed by Lebbeus Woods. He describes a free-zone as a structure within which groups interact through consensus. It is devoid of outside political or institutional influence or control. "It is established on the principle of dialogue, carried on through instrumentation extending the senses and capacities of individuals into domains of the microscopic and macroscopic, facilitating direct experiences of them." Further, he describes Freespace as "a new spatial manifestation of the boundaries of individual autonomy." (Woods, L, 1992)

As with Tschumi's view of architectural space, cyberspace defies precise definition, and therefore affords a rich environmental model for spatial designers, whether they inhabit it or visualise it.

Sometimes we need to be free of edges, pre-conceptions, rules and certainty.

Whilst the debate over definitions of cyberspace and its relationship to virtual reality is important because it forces us to address the issues of space and how we use it, the actual definitions in themselves are of less consequence. In any case, as technology moves on and our ideas mature, the precise language changes. It is the ideas that are important. Most descriptions of cyberspace would concur that it is the virtual space of the computer memory and networks, telecommunications and digital networks. Virtual Reality on the other hand is defined as an immersive virtual physical environment with user interfaces.

Neuromancer was first published in 1984. Few of the millions of people who have ever used the term Cyberspace will know of its genesis. William Gibson's world was sleazy, dangerous and bleak. But his description of what he saw as another world defined by the hardware and software of this dystopian future was to become the foundation for later generations of digital frontiersmen. Ever since Gibson suggested that there could be another kind of dimension defined by the binary data structures in transit between two or more machines we have been searching for ways to interact with it. It has been represented in a huge variety of different ways some provoking, but many ludicrous or risible.

The world that Case navigates in Neuromancer is represented as an abstract landscape characterised by patterns, colour, light, layers but with an overall sense of movement around and through planes, borders and portals. There is never a real feeling of a full three (four) dimensional experience. He interacts with this world via 'dermatrobes' and is in a heightened state of anxiety. It is tense, exciting, stimulating but dangerous.

By contrast, Hiro Protagonist, freelance hacker, pizza deliverer and sword-fighter inhabits a far more colourful, well-defined and multi-dimensional world. The "Metaverse" uses a Global city for its structural metaphor. The metaverse is a black globe 65,536 km in circumference. The natural condition is darkness,

but the "Street", the main thoroughfare, is brightly lit. As people log on to the system their avatar appears at a port on the Street. They can travel around on foot but to move long distances software transport is available.

So this artificial environment is structured, and based upon a model of our own world. Basic physical and cultural rules can therefore be assumed by anyone visiting the metaverse. This seems to reflect the need society has to impose its own structure and meaning on anything it colonises, real or imagined. Given the amazing range of possibilities it is odd that we choose to be so limiting. We could after all be anything in any kind of world. It could be so liberating.

In spite of its anarchic narrative Snow Crash envisages a world that is still controlled by corporate power and greed, a mirror image of our globally institutionalised world. Quite the opposite to that anticipated by Woods in freespace. This world reflects our real one with the same level of disenfranchisement for those without the money, power and therefore bandwidth.

Any discussion of virtual environments is inevitably conditioned by how the interaction with that environment is effected and therefore how many of our senses are employed. Protagonist interacts with his world via a pair of goggles and a laptop. "The computer is a featureless black wedge." It is connected to the rest of the world by a "hair-thin fibre optic cable. The cable is carrying a lot of information back and forth between Hiro's computer and the rest of the world. In order to transmit the same amount of information on paper they would have to arrange for a 747 cargo freighter packed with telephone books and encyclopedias to power-dive into their unit every couple of minutes, forever." These goggles are serious. They are activated by a stereographic laser beam from the laptop to provide realistic holographic images and sound. "So Hiro's not actually here at all. He's in a computer-generated universe that his computer is drawing onto his goggles and pumping into his earphones. In the lingo this imaginary place is known as the Metaverse. Hiro spends a lot of time

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in the Metaverse. It beats shit out of the U-Stor-It.” (Stephenson, N, 1992)

We don't know how he initiates movement and interaction in the artificial world but assume it is gesture-controlled. But how real is his world without touch, smell or taste?

Case on the other hand is connected by dermatrobes which we assume means that he is controlling his interaction by neural impulses. In the film *The Matrix*, connection is effected by a probe inserted at the base of the skull - a rather tear-invoking start to cyber travel. But through this direct neural hardwiring all the participants experience full immersion in their soft world. To such a degree that to them it is real.

Will we ever experience true immersive virtual reality if we are unable to utilise all our senses? We experience space with all our senses and sometimes smell and touch are as important as sight and hearing.

Space and Place

Mobile telecommunication networks, high bandwidth computer networks and global satellite positioning systems have transformed our perception of time and place. A project can exist in many locations around the world simultaneously. Designers in the UK can be working for clients in the US, manufacturers in Malaysia and marketing companies in Japan. A conventional working day no longer exists, as prototypers go home in the far east, the designers start a new day in the UK with a new batch of queries just received by Email.

A telephone call to a colleague or friend may just as easily be picked up in Rio or Tokyo, as in Croydon. We communicate across time-zones and cultures in a way that renders place immaterial. We are no longer aware of the links that bind different aspects of our communication channel together. They are far too complex and arcane for us to comprehend. Peter Zellner, suggests that “confronted...by multiple emergent dimensions of continuous returns and re-cyclings, architecture can shed the burden of the nostalgia for place and the oppression of a falsely

perceived internationalism”. (Zellner, P, 1999)

No longer do we stop for a chat with our bank manager in the High Street, or pop in to see him at the Esher branch of the NatWest. Instead we carry out our financial transactions by telephone or computer. We telephone a placeless number from our placeless cell phone and connect to our surrogate bank manager in Manchester or Newcastle, the only clue to its location being the regional accent of the operator. And in any case the location is of no consequence.

As we move to a position of complete dislocation between space and place the remaining vestiges of those memories are discarded leaving us little of the former place-related structures. The telephone regional code numbers that still retain traces of the archaic exchange-based three figure letter codes are gradually becoming infiltrated by the more pressing requirements of the burgeoning telephone communication network.

Real Space, Virtual Space

“The virtual is real but not actual, ideal but never abstract. Indeed, the two sides of this purported dialectic, the real-actual and the virtual imaginary are not distinct halves but something akin to oscillating forces in a shifting field, existing not side-by-side but through and across each other.” (Zellner, P, 1999)

As a way of illustrating his Theory of Ideas, Plato offered us the simile of the cave in which the prisoners chained there see only shadows. These they take to be reality. For Plato it is the idea that is real, the particular is only apparent.

Marcos Novak believes that the idea we call cyberspace is in fact a much more pervasive and inescapable information space completely enmeshed in our culture. His work explores the integration of physical and virtual spaces. For him physical space has been irrevocably transformed by virtual space, through an interweaving of non-Euclidian spatial concepts, with aspects of algorithmic unfolding, meta-data visualisation and navigable computational environments.

It is useful for us, as architects, to contemplate what constitutes real and virtual and how it impacts on our perception of space. In the film, *The Matrix*, we are persuaded that what we take for reality is, in fact, a vast software construct. It soon becomes clear that what appears to be an actual world governed by all the physical laws of the real world is actually a copy of it in appearance but not in experience.

Such is our absorption of the virtual world into our physical world that we sometimes mistake one for the other. A BMW driver was recently reported to have driven into a river where his GPS system told him there was a bridge. His visual senses were informing him there was no bridge but he preferred to believe his car's system to the evidence of his real world perception.

Conclusion

Our contemplation of virtual worlds will have an impact on our perception of architectural space far beyond the realms of virtual reality. It reminds us that there is more involved in our occupation and understanding of space than its mere containment and definition by constructed elements. As architects we must remain in touch with the sensory, poetic and liberating aspects of space and not treat it as just another commodity that requires packaging.

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