Speed and Relativity:
Toward Time-like Architecture

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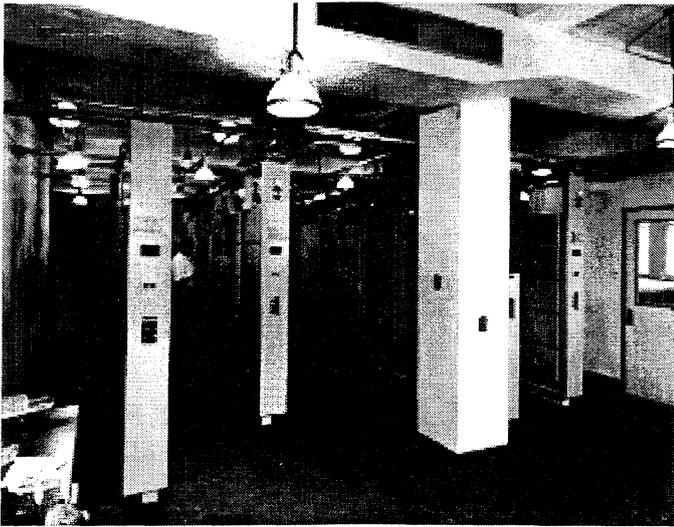
Figure 1: U.S. Army Photo A51244. Bell Relay Computer. *showing racks in which the computing. storing and controlling relays are mounted.*

INTRODUCTION

When an observer achieves the speed of light. the space outside his frame of reference both ahead of him and behind merges so that the space he sees is infinitely thin. Front and back as well as sides can be imagined to be all here. Gertrude Stein's devastating description of her hometown. "There is no there. there." could also apply to the condition of space at the speed of light: There is no there. there because it is all here . . . Whenever space contracts. time. its complement. dilates. (Leonard Shlain. 1991)

Cultural critics dating back to Jacques Ellul have repeatedly pointed out the shift—in technological societies—from space-centered institutions to time-centered institutions, from material-based economies to information-based economies and from fixed, coherent belief systems to fluid, fragmented worldviews. The proposition put forth in this paper is that architecture, as it is traditionally defined and practiced as a space-based profession, is being increasingly marginalized. Time and speed have come to be the major

realms of world action today. Architecture of space has become impotent, immaterial and marginal while architecture of time is becoming increasingly significant. This paper examines the impact of such transformations in the context of information technologies.

Architecture as (timeless) space

For millennia, architecture has been understood, practiced, and theorized as the discipline of space.[1] It is an eternally held notion that architecture fundamentally deals with the formation and configuration of space through the use of material. Traditionally, architecture has been employed to determine and fix social conditions through the use of materials and spatial patterns.

Various discourses of architecture have so far revolved around static formations of physical space. Theoretician K. Michael Hays rightly pointed out that we have "moved from Sigfried Giedian's modernist notion of space-time to Henri Lefebvre's Marxian 'production of space' to a Foucaldian linking of space, knowledge, and power, to most recently, a concern shared by those interested in the construction of gender, sexuality, and difference with space and its physical internalization" (Hays 1998). Henri Lefebvre's seminal work Production of Space effectively sums up the discourses of production of space (social, physical, political, etc.) and how various disciplines—from mathematics to art—have tried to territorialize those discourses (Lefebvre 1991).

FROM SPACE AND TIME TO SPACE-TIME

Speed finally allows us to close the gap between physics and metaphysics. (Virilio 1991)

The physics and metaphysics of Theory of Relativity transformed our understanding of space, time and the inseparability of space, time, and movement. Back in 1939 Giedion wrote the famous book *Space Time and Architecture* (Giedion 1971). He was the first to bring the issues of interconnectedness of space and time albeit he does not explicitly discuss the impact on or applicability of Theory of Relativity to architecture.

In 1908, Minkowski remarked, following Einstein's formulation of the Theory of Relativity in 1905, that "from now onwards space and time are to degenerate to mere shadows and only a sort of union of both retain independent existence," there was a deep sense in which time and space are 'mixed up' or interlinked (Born 1962). This is evident from the Lorentz transformations of special relativity that connect the time t in one inertial frame with the time t' in another frame that is moving in the x direction at a constant speed v. The relationship is:
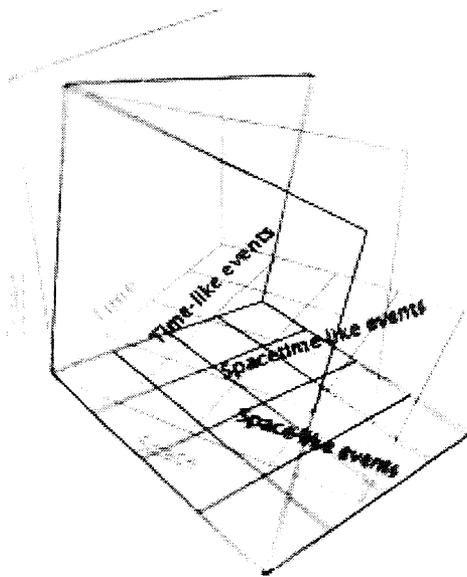
$$t' = [t - vx/c^2]/[square\ root(1 - v^2/c^2)]$$

Figure 2: Lorentz transformations

In this equation, t' is dependent upon the space coordinate x and the *speed*. In the language of relativity, events are describable only as "*space-like*" or "*time-like*" or "*space-time-like*" (Born 1962). In this way, time is not independent of either space or speed.

While most people have assumed that the inseparability and interdependence of space and time are not a matter of common sense or day-to-day experience, the interdependence of space and time manifests itself in an intriguing if not baffling manner in our built environment. The physics of space-time interdependence is directly connected to the metaphysics of the relationship between space, time, and movement. This dynamic becomes very evident when we examine the impact of speed on the dematerialization of space and valorization of time.

Unlike many people (including architectural theoreticians) who have come to treat Theory of Relativity to be applicable and observable at only a cosmic scale, Paul Virilio has poignantly pointed out the metaphysical implications of space-time and speed: "If as suggested by relativity theory, speed expands time in the instant it

contracts space, we arrive finally at the negation of the notion of physical dimension, and we must ask once more, 'what is a dimension'." (Virilio 1991)

FROM TIMELESS TO SPACELESS: THE END OF ARCHITECTURE?

2MPH-30MPH (10,000 BC to present): Somatic Space

At the beginning was the space of the body: the material space. Movement of knowledge was synchronous with the movement of the body. Being and knowing unfolded in the material world with human body at its center. Architecture, the first mass medium known to humankind was the chosen agency to organize, control, stipulate, and command the space structure of civilizations. Therefore, politics was firmly rooted in the architecture of the material space. *Architecture was the central realm of communion and communication.* Architecture was conceptually "timeless." Public buildings were built to last forever —for eternity, if you will.

2MPH-1000MPH (1400 AD to present): Textual Space

Not until the advent of printed text did the grip of somatic space loosen on the human civilizations. As Victor Hugo exclaimed, word killed stone. Knowledge could now move by itself through the virtual medium of printed text with the human messenger being only an infrastructural carrier—relegated to a marginal status. Knowledge was, for the first time in human history, liberated from being "embodied" in architecture and human body. Soon, societal institutions began finding legitimacy in printed text. Consequently, architecture was stripped of its central political and cultural role and pushed aside. However, architecture was still a place to "commune" while communication was relegated to print medium.

186,000MPH (1900 AD to present): Broadcast Space[2]

The next wave of virtual media—radio, telephone, telegraph, cinema, photography, and television—transformed the composition and ethos of how societies built themselves. While text was still rooted in the physicality of paper, with the electronic media one did not have to move a thing in order to communicate. While print media undercut the epistemological contiguity of the built world, *electronic media undercut the ontological contiguity of experience and context.* Political debates and propaganda could "take place" and reach millions of people without moving a thing — all happening in simultaneous time. As Marshall McLuhan noted, there would have been no Hitler without radio. While books and bodies could be banned, exiled, and locked up in buildings, electromagnetic waves could not be. Walls, windows, and doors of traditional architecture lost their meaning as knowledge and communication could not be organized, controlled, or prohibited through conventional architectural means. The traditional notions of wall, enclosure, perspective, horizon, etc., which were based upon somatic space, became meaningless in the light of televisionic space. Solar day

held little meaning in the televisionic day, which came to structure new rhythms of the cities in technological societies. Hence, architects had to ask such a seemingly basic question as "what does a brick want to be" ten thousand years after we first built with a brick. This turn to legitimacy in the use and truth of material was symptomatic of the *imm*aterialization of architecture, as we have known it so far.

186,000MPH (1946 AD to present): Cyberspacetime

Cyberspace and virtuality are two of the many notions popularized by the advent of general-purpose computers. No other medium has received so much hype and attention (with an obsessive fascination for William Gibson's portrayal of cyberspace) albeit some of it is well needed. Unlike the previous media, electronic or not, we now have a medium and technological environment that holds the prospect of rivaling human intelligence or at least a few aspects of it. The new medium is truly cybernetic and digital with its interactivity. In my explorations to follow, I will stay away from Gibsonian narratives of cyberspace.

THE MESSAGES OF THE NEW MEDIUM-ENVIRONMENT

...the "message" of any medium or technology is the change of scale or pace or pattern that it introduces into human affairs. (Mcluhan 1964)

I will now discuss a number of significant characteristics of the new medium-environment by tracing various symptomatic techno-cultural trends.

TREND #1

Miniaturization: Honey, I Shrunk the World!

Now all you need to do is create a vacuum in a rectilinear tube so as to allow one ray of light to pass through. No more roads to be laid, no more surfaces to be leveled. Now one produces vacuum out of volume. (Virilio 1991)

Cyberspace is non-spatial. The suffix *space* in the word *cyberspace* is a misnomer and a metaphor at best. In sharp contrast to the material space of the pre-print civilizations, space is now a simulation, a representation, and a metaphor for our bodily experience of four-dimensional space. The logic of cyberspace is non-spatial in its propagation, generation, manifestation, and production. What then is the true logic of cyberspace? The true logic of cyberspace is in its reliance on time. 600MHZ, 10MB/Sec, 56K BAUD, real-time (1/10th of a second), nanosecond, refresh-rate . . . do you hear anything related to space in this list? The measure of cyberspace is time— the digital, technological time of the pulsating electrons. An email sent to you is measured in terms of size and time taken to reach you, but not in terms of the space that it traveled to reach you. Interestingly, printed media and electronic analogous media both contain within them traces of space they travel. A letter from your

friend in Finland would contain the traces of its trajectory. A radio reception fades away as you move away from the transmitter. However, with digital environment, space and distance bear no effect on its content.[3]
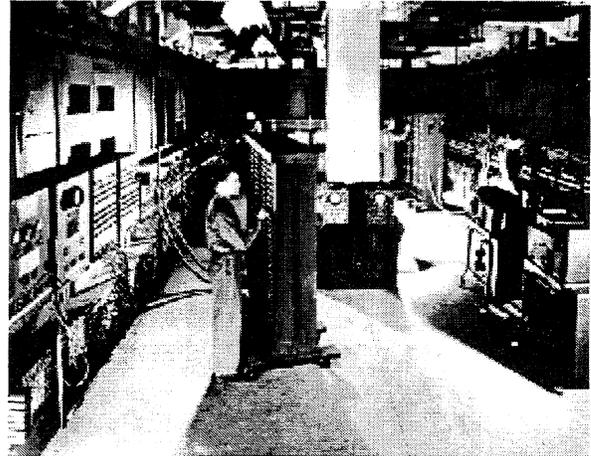

Figure 3: ENIAC *at University of Pennsylvania. 1945 AD. U.S. Army Photo.*

Miniaturization, which is at the heart of de-spatialization of our world is, according to Daniel Bell, one of the major transformative trends of technological development (Bell, 1973). In 1946, world's first general-purpose computer, ENIAC (Electronic Numeric Integrator and Computer) was unveiled in Philadelphia. It occupied a room of nearly 23,000 square feet. It consisted of 18,000 vacuum tubes, 70,000 resistors, and 10,000 capacitors, arranged in 40 panels in an 80-foot "U." It weighed about 30 tons. It performed 5,000 additions in one second or 2.50 multiplications in one second. Given below is an original lay out of the various machinic components.
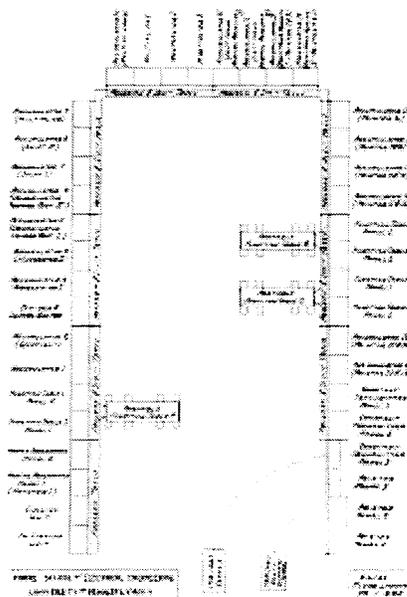

Figure 4: U.S. Army drawing. A layout sketch of ENIAC. *1945 AD.*

In 1996, all the original capabilities of "ENIAC" were built on a microchip of size 7.44 by 5.29.mm (0.004237 square feet) using a 0.5 micrometer CMOS technology: a 5,429,138 fold shrinkage in space!

First, architecture was robbed of its communicational significance by printed word. This was followed by the electronic media stripping architecture of its material significance and communal role. Till the advent of microchips, architecture was at least performing an infrastructural role, which was very different compared to the politically central role it played in antiquity. Finally, the slaughter of architecture — the most conservative profession by any account — is complete with the arrival of the computer-mediated and networked virtual worlds. Architecture has paid its price for its inflexibility of methods, materials, techniques, and boundaries by being robbed of its fundamental roles. All the powerful technological nations have moved into a time-centered system of economy and politics. The world has migrated from geopolitics to chronopolitics. What is left behind? Architecture, definitely.

Paul Virilio comments:

A strange topology is hidden in the obviousness of televised images. Architectural plans are displaced by the sequence plans of an invisible montage Where geographical space once was arranged according to the geometry of an apparatus of rural or urban boundary setting, time is now organized according to imperceptible fragmentations of the technical time space, in which the cutting, as of a momentary interruption, replaces the lasting disappearance, the "program guide" replaces the chain link fence, just as the railroads' timetables once replaced the almanacs. (Virilio 1991)

He goes on to observe that "The new produced and projected space has less to do with lines, surfaces and volumes than with the minutiae of view-point, the dynamite of tenths-of-seconds. These viewpoints are simultaneously time-points in the tele-topological continuum of long-distance projection and reception." (Virilio 1991)

Going back to Minkowskian notion of interconnectedness of time, space and speed, we could conclude that the human quest for speed, the quest to conquer space, the quest to save time, translate to the end of space or at least the end of its centrality. Speed, pursued through the internal combustion engine (the automobile) had transformed the structure of our cities. Automobile-centered city development had led to movement-based (infra)structure of the cities. Speed pursued through instantaneous communication of electronic and digital media is now leading us to a total subversion of four dimensional space-time into fractured and discontinuous melange of artificial horizons, perspectives, juxtapositions, connections, light and knowledge flowing through non-spatial infrastructure.

The metaphysical transformation initiated by non-spatial technologies, simply put, is that speed transforms space into time. Alternatively, we could say that acceleration transforms space-like events to time-like events. All the powerful institutions of socio-political transformation have now moved into the non-spatial and non-material domains. Less than 2% of the US economy is paper-based; the rest is electronic and digital. Where money is, is where action is. As architects, we certainly know that there is no money in architecture. That is simply a consequence of having no money in space-based ventures. Virilio exclaims how the last bastions of space have been taken away from architects: "So it makes perfect sense that when we discuss space technologies today, we are not referring to architecture but rather to the engineering that launches us into outer space." (Virilio 1991)

There is really no use grieving over the marginalization of architecture. However, we must be aware of, if not understand, the shifts and inversions in the today's technology-dominated world.

TREND #2

Ubiquity: Being Everywhere and Being Nowhere

With acceleration there is no more here and there, only the mental confusion of near and far, present and future, real and unreal—a mix of history, stories and the hallucinatory utopia of communication technologies. (Virilio 1995, p.35)

Another bastion of spatial primacy is being breached through technology's pursuit of ubiquity. To be everywhere negates the spatial notion of being here or there. Being everywhere also negates the notion of center and periphery. Whole world becomes a homogeneous field of unvarying value. Marshall McLuhan noticed this phenomenon already a few decades ago: "Electric speeds create centers everywhere. Margins cease to exist on the planet." (McLuhan, 1964) Architecture has traditionally worked with configuring body's position in space in relation to another body or activity. This configuration created the notions of here, there, orientation, direction, juxtaposition, adjacency, distance etc. These notions are now being replaced with the arrival of ubiquity. You carry your cell phone and your computer around, as one advertisement of a dot-com company makes it amply clear, the place, and orientation of your body and its relationship to the built world simply does not "matter" anymore.[4] That advertisement at once avouches the death of architecture as we had known it till yesterday.

TREND #3

Communing in Time: Real-time, simultaneity, and instantaneity

For telecommunications, coming together in time means, inversely, distancing oneself in space . . . it is as if telecommunication's 'populating of time'—such as vacations, interruptions, and so forth suddenly replaced all the ancient cohabitations, the populating of space, the actual urban proximity. (Virilio 1991)

Real-time is defined as the simultaneity of events occurring within 1/10ᵗʰ of a second. In a large auditorium, it may take up to 1/3ʳᵈ of a

second for you to hear a speaker if you are seated at the other end of the room. In the meantime, its broadcast or cybercast would have already reached a person thousands of miles away! If one of the fundamental laws of space dictates that no two objects can occupy and the same place at the same time, it meant that no two people could experience exactly the same event. However, that phenomenon is circumvented through electronic broadcasts where millions of people could occupy the "same seat" in the auditorium and experience the same image and sound even when they are thousands of miles apart! The existence of electronic real-time necessarily precludes possibility of materEal space. The mantra of real estate industry used to be "location, location, location." The new slogan for the virtual real estate is "time, time, time."

Theory of Relativity makes it clear that there is time dilation between one frame and another. For example, the faster a clock moves (say, in a space ship), the slower it runs, relative to stationary clocks. Time dilation shows itself when a speeding twin returns to find that his (or her) Earth-bound twin has aged more rapidly. Interestingly, we have been experiencing a time dilation in architecture and culture today. Speed exposes the finest nuances of time to human experience. Each nanosecond expands to become eternity. The impatience of a driver experiencing time dilation at a traffic light, the rush of people speeding to escape the time dilation of the expressway, the impatience of a person in front of a slow computer which takes an extra second to perform a complex calculation are things that each of us have experienced. In architecture, we once used to build for eternity. We now design buildings that are made to last for 10-20 years. For we cannot visualize a future beyond such a time frame anymore.

TREND #4

The Omega Point: The Formation of Noosphere

Nearly five decades ago, much before the computer became a popular machine, Teilhard deChardin prophetically proclaimed that the human evolution is heading toward a global coalition of an interconnected world. He called such a world "Noosphere" (the sphere of interconnected human beings). He predicted that such a coalition would happen at a point in time called "Omega Point." Not in a too distant future, we can easily envision people being connected with the invisible threads of digital communication where material space will not have much meaning. As of today, there are an estimated 56,000,000 hosts the Internet. The Internet is growing at a rate faster than television, radio, and telephone combined. What does this mean to architecture? It means one of these two possibilities: architecture will remain a space-centered, marginalized and conservative profession; or architecture redefines its boundaries to address the contemporary developments and jumps up to the center stage.

Fluidity is one of the conditions experienced everywhere in this global economy. In economics, one of the problems faced is the fluidity of money and transactions. According to some analysts 98% of US economy is electronic. The condition of fluidity coupled with motion at the speed of light leads to volatile local conditions and intensified global conditions. Fluidity positions any human activity to be handled temporally.

The problem with the education and practice of architecture today is that, in general it ignores or even denies the transformations occurring everywhere in the technologically advanced parts of the world. We revel in the glory of the past because that is all we have left. Or we sell ourselves as a service-oriented industry bending over backwards to respond to the "needs" of the clientele at the expense of larger ethical issues. Recognition of a phenomenon does not automatically mandate an acceptance of a condition. Nevertheless, it does mandate a response. Ignorance and denial or a reliance on past glory is certainly not a very intelligent response.

TREND #5

Virtuality: All that is sold literally melts into air

Greg Lynn raised a valid question when he said that "The term virtual has recently been so debased that it often simply refers to the digital space of computer aided design. Virtuality is also a term used to describe the possession of force or power." (Lynn 1999) If by virtuality we mean the force and potential or quality and essence of being without material existence, then we are reminded of Daniel Bell's notion that our economies have begun to do more and more with less and less material agencies (Bell 1973). Economies are becoming increasingly based on mental labor and movement of information, rather than physical labor and the movement of matter. Nicholas Negroponte has made a similar observation when he noted that the world is being increasingly concerned with the movement of bits than the movement of atoms (Negroponte 1995).

However, contrary to a widely-held belief that virtuality is somehow a direct offspring of the computer, we need to recognize that the notion of virtuality, at least as far as architects are concerned, dates back to the day when we as a profession started drawing instead of building. Once again, as Greg Lynn critically noted, "Architecture is the profession concerned with the production of virtual descriptions as opposed to real buildings". We have been designing the buildings virtually. Legally speaking, we do not even "oversee" or supervise the construction process; rather, we "observe" it distantly. Surely, a virtual medium, an intermediate agency to try, visualize and evaluate various conditions "virtually" on paper or through a model or in a computer helps one thing: control over failure. Truly speaking the built work becomes a representation of the virtual drawings than the other way round. The drawings become the master bodies of knowledge from which to build the "result". It now takes less than 9 months for Chrysler to begin a new model car, design it, test it and put it on the assembly line. It used to take them 3 years before the use of the computers.

STRATEGIES FOR A RESURRECTION OF ARCHITECTURE

[Human being] has been liberated little by little from physical constraints, but he is all the more the slave of abstract ones. He acts through intermediaries and consequently has lost contact with [material] reality ... Man as worker has lost contact with the primary element of life and environment, the basic material out of which he makes what he makes. He no longer knows wood or iron or wool. He is acquainted only with the machine. His capacity to become a mechanic has replaced his knowledge of his materials. (Ellul 1964)

One might pose the question "does the discussion thus far mean the end of architecture?" Far from and worse than that, architecture is (going to be) alive but, in general, it will continue to lead a life of insignificance. Instead of being the bone or muscle of the society, it is being reduced to the fat of the society and relegated to remain in the societal margins. When the economy is doing well it swells. Otherwise it flinches. The field of architecture is surely at a point of its existential crisis. What then are the strategies that may restore the vitality and centrality to the field of architecture? To begin with, here are a few strategies:

Redefine and redraw the boundaries of what we call architecture. To embrace virtual worlds on one end and entrepreneurial initiatives on the other maybe a good place to start. This strategy would also entail intensification and expansion of the discourse of architecture. Architecture needs to overcome its reputation of being a conservative profession that thrives only on the strategy of resistance.

Architecture, in any event, must become a critical practice as opposed to being a merely technical service provider who produces infrastructure in response to the so-called clients' needs.

While most of the societal institutions find their centers of action transferred to virtual worlds, until we can say "Scotty beam me up!" we are bound by the laws and limitations of being embodied in a corporeal body. Toyo Ito calls it the primitive body. Disease, pain, death, pleasure, sexuality, and the primacy of having to interact "face-to-face" (as opposed to "interface-to-interface") in the material world, still govern our existence. Liberation from the constraints of material space and bodily existence does not mean marginalization and neglect. Human body has lost its centrality. Nevertheless it is still the center of existence.

One reason that people turn to architecture is that it mediates how humans dwell (in a Heideggeran sense of dwelling as an ethical prerogative of human beings) in this world. Architecture has the potential to mediate between the tangible and the virtual, between the material and the ethereal. Such mediation definitely invokes a critical role for architecture. Instead of merely "housing" and "accommodating" things and flows, instead of degenerating to a status of infrastructure, architecture could, through a critical

response to its "times", provide the much needed connection and mediation between various realms of existence and experience.

Traditionally a majority of the architectural professionals have vociferously maintained the narrow boundaries of architecture as that which is physically built. Evolution often involves a transformation of a species into a whole other kind of species. Perhaps a greater tolerance, if not an enthusiastic promotion of expanding the boundaries of architecture to embrace a number of adjacent territories may lead to a revitalization of the field of architecture.

NEW AND CRITICAL DIRECTIONS: TIME-LIKE ARCHITECTURE

The cultural expectation that buildings must be permanent infers that building's physical and symbolic form should persist. Rather than designing for permanence techniques for obsolescence, dismantling, ruination, recycling and abandonment through time can be studied. (Lynn 1999)

A number of architects have directly or indirectly addressed the notion of time-like architecture: Greg Lynn, Peter Eisenman, Toyo Ito, Bernard Tschumi, Rem Koolhaas, Zaha Hadid, Richard Rogers, Neil Denari, Wes Jones et al. have developed work that takes into account the time-like events that dominate our world today. Although it is not possible to go into the details of their works to exemplify the ideas discussed in this essay, a brief survey of some of their ideas might help.

Greg Lynn discusses the role of digital technologies in enabling ways to deal with time-like events in architecture:

The introduction of time and motion techniques into architecture is not simply a visual phenomenon . . . Another obvious aesthetic fallout of these spatial models is the predominance of deformation and transformation techniques available in a time based system of flexible topological surfaces. These are not aesthetic choices but technical statements of the structure of the topological medium. (Lynn 1999)

While Lynn stays away from any discussion of the ethical and socio-political issues and repercussions of time-like architecture, his work does open doors to further thought in this direction.

CONCLUSIONS

In the age of telepresence and networked virtual worlds, the notions of space, time and materiality have undergone dramatic shifts. The metaphysics of Theory of Relativity explicate the interdependence of space, time, and speed in a discontinuous field of forces. Where movement is relatively little, events become "space-like." Where movement takes precedence over stillness, events become "time-like." Speed is the distinguishing factor between these two

kinds of event readings. Through various communication and transportation technologies, we have moved far beyond the 2MPH speed of a walking human being to 186,000MPH speed of radio waves. We have moved from populating space to populating time. In the process, architecture has lost most of its social, political, cultural and existential significance. This was partly due to the conservative nature of the profession and its allegiance to "timelessness" and static tectonics even in the age of Noosphere.

The latest information technologies possess dramatic new potential. They allow ubiquity, simultaneity, instantaneity, virtuality, remote-interactivity and capable of real-time computation. These phenomena are anti-spatial and pro-temporal in nature. Thus, architecture is faced with the most daunting prospects of all time, contrary to the proclamations of some cyberspace proponents.

New technologies raise new ethical questions and open up new possibilities. Architecture needs to address the time-like environment in which it finds itself today. The tasks for architecture and design computing are many. Architecture could mediate between the tangible and the intangible, between the material and the virtual and between space and time. Architecture could become the point of contact of the realms that are worlds apart. If, as Heidegger proclaimed, dwelling is the primary ethical imperative of human beings, then architecture needs to be brought into the world with a critical mission of connecting, re-spatializing and temporalizing a world that is fast disintegrating into bits of sand.

REFERENCES

Bell, Daniel. *The Coming of Post-Industrial Society*. New York: Basic books, Inc., Publishers, 1973.

Benedikt, Michael. *Cyberspace: First Steps*. Cambridge, Massachusetts: MIT Press. 1991.

Born, Max. *Einstein's Theory of Relativity*. New York: Dover Publications, Inc. 1962.

Casey, Edward. *Fate of Place: A Philosophical History*. University of California Press. 1995.

Derrida, Jacques. *Archive Fever*. Chicago: University of Chicago Press. 1996.

Ellul, Jacques. *The Technological Society*. New York: Vintage Books. 1964.

Giedion, Sigfried. *Space. Time and Architecture*. Cambridge, Massachusetts: Harvard University Press. 1971.

Hays, K. Michael. ed. Architecture Theory Since 1968. Cambridge, Massachusetts: MIT Press. 1998.

Lefebvre, Henri. *The Production of Space*. Cambridge: Blackwell Publishers. 1995.

Lynn, Greg. *Animate Form*. New York: Princeton Architectural Press. 1999.

McLuhan, Marshall. *Understanding Media: The Extensions of Man*. New York: The Signet Book. 1964.

Peterson, Steven. "Space and Anti-Space." Cambridge, Massachussets: Harvard Architectural Review number 01. (1980).

Shlain, Leonard. *Art & Physics: Parallel Visions in Space. Time & Light*. New York: Quill William Morrow. 1991.

Virilio, Paul. *Lost Dimension*. New York: Semiotext(e). 1991.

Virilio, Paul. *The Art of the Motor*. Minneapolis: University of Minnesota Press. 1995.

NOTES

[1] Space is defined here as a 'domain of possibilities or activities'. Place maybe defined as a set of institutionalized spaces. The shift during Modernism from place to space indicates a breakdown of traditionally instituted space and the emergence of a radical, fluid and unformed conception of space. See Steven Peterson's article "Space, Anti-space" (Peterson 1980) for further discussion on these issues. Also see Edward Casey's The Fate of Place for an in depth discussion of various issues of space and place from antiquity to the present times (Casey 1995).

[2] For contextual contiguity of the ideas being presented here, and for reasons of brevity I am consciously avoiding a discussion of the role of automobile in the transformation of architecture.

[3] Here, it would be apt to recall Marshall McLuhan's discussion about light bulb as a medium. He shows how its content and message are inseparable. He says "the electric light is pure information . . . For electric light and power are separate from their uses, yet they eliminate time and space factors in human association exactly as do radio, telegraph, telephone, and TV creating involvement in depth." (McLuhan 1964, pp. 23-25).

[4] The advertisement by mySAP.com shows how easy, quick, and advantageous it is to book your tickets "on line" irrespective of your physical position as opposed to standing "in the line" in an airport terminal.