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The cognitive turn in the age of information and communication

Introduction

A recently published volume I co-edited, entitled *Cognitive Architecture: From Biopolitics to Noopolitics. Architecture and Mind in the Age of Communication and Information*,[1] contains contributions from scientists, theorists, scholars and architects which, to my mind, touch upon many of the issues and concerns that have motivated the *Interoperabel Nederland* publication. Therefore, for this chapter I have drawn liberally from my own introduction to *Cognitive Architecture* in the hopes to identify a few key issues and concepts that I feel are of particular importance to both current and future debates on the impact of such things as media, networks and ambient technologies, and their impact on individuals, societies and cities in this era generally referred to as the Information age.

There can be little doubt that the term *information society* indicates much more than a mere step or phase in socio-political development as typically indicated by such monikers as *agrarian*, *industrial*, *post-industrial* or *network society*. In the late 1970s Jean-François Lyotard was commissioned by the government of Quebec to produce a report on the current state of knowledge and information as it related to the sciences. The resulting publication, *The Postmodern Condition: A Report on Knowledge*,[2] quickly became regarded as a seminal work and a fundamental read for anyone concerned with what was rapidly becoming apparent as a socio-cultural shift in what may be generally described as a *turn in modernity*.

I do not intend to summarize Lyotard's report here; but I mention it for the reason that he already raised fundamental questions of legitimation regarding, as Jameson stated later,[3] "technocracy and the control of knowledge and information." Put simply, when organizations and institutes engage in discussions about information – and thus, naturally, about the distribution of information – matters of socio-political power and the modes in which power relations are exercised must be questioned. Such issues are increasingly relevant as I aim to suggest with this chapter as a report to the Dutch Standardisation Forum.

Since the mid-eighteenth century, it has been widely argued that western societies have made a sustained move from the visual dominance or specular-centrism of the Enlightenment project to the textual dominance of language-based computer technologies. Of course, this transition from knowledge to information did not come free of intellectual concern. For instance, computers were first to be seen as depersonalizing, supplying knowledge for the sake of the market good at the cost of all previously held forms of representations as well as non-representational forms of reality. Heralding the loss of the humanist subject, computer technologies were seen as both a tool and a transformer. Similarly, Walter Benjamin had much earlier announced such a transformation in relation to cinema and "mechanical reproduction," as modes of production capable of altering our entire "modes of existence."[4] Not unlike Michel Foucault's theory of the Panopticon, these new technologies might be understood as emanating from "disciplinary societies;" the differential shift occurring only between political and economic forms of (illusory) democratic emancipation. Both the computer – Lyotard's cognitive regime of phrases – and the Panopticon – Foucault's regime of

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[1] Deborah Hauptmann and Warren Neidich (editors), *Cognitive Architecture: From Biopolitics to Noopolitics. Architecture and Mind in the Age of Communication and Information*, 010 publishers, 2010.

[2] Jean-François Lyotard, *The Postmodern Condition: A Report on Knowledge*, originally published 1979 in French, translation by Geoff Bennington and Brian Massumi, Manchester University Press, 1984.

[3] Fredric Jameson, Foreword, in: *The Postmodern Condition*.

[4] Walter Benjamin, The Work of Art in the Age of Mechanical Reproduction, orinally published 1936, in: *Illuminations*, Shocken Books, 1969.

truth – exemplify mechanisms that both function, or act, as devices created by man for the use of man (here we see a new teleology emerging), as well as machines for inscribing (programming) emergent forms of social reality. It should be clear that what I am recalling here constitutes an entire socio-cultural shift. Equally, with this, I would like to suggest that over the past several decades we have been engaged in nothing less than a profoundly affective *cognitive shift* with respect to the socio-political relations between individuals, groups and institutions of governance. This will be briefly elaborated below in terms of "societies of control;" and with Gilles Deleuze and Maurizio Lazzarato we might understand this as the new *regime of information*.

Before continuing to the body of this chapter, though, it is important to state that, to my mind, what we now ubiquitously refer to with the general term information must be understood as constituting highly embedded forms of technological systems. They are increasingly dispersed, being dynamically related to complex modalities of power and relations of power in ways that most individuals cannot readily fathom. It is equally important to recognize that such information and communication technologies do not operate passively as mere containers or so-called highways that facilitate the storage and flow of (inert) data. Such technologies, such media in fact, operate within what we should understand as a modality of invention; thus creating complex conditions of both control and resistance.

I believe that discourse pertaining to the information age requires a critique that understands this second order of dynamic invention in relation to technologies of information and communication. Here too, our understanding of subject-object relations must expand to incorporate new forces and forms of virtual-real interface – such as networks, nodes, links, codes – between equally new forms of actor-agents. A recent IBM advertisement goes so far as to suggest that "the planet has grown a central nervous system,"[5] referring, among other things, to how the DIKW triangle (Data-Information-Knowledge-Wisdom) has transformed into a highly interconnected and complex epistemological system (systems-of-systems). There is little doubt in my mind that the effects of these immaterial systems impact greatly on architecture thinking; however, it remains even more relevant to consider how emerging modes of spatio-temporal realities (both immaterial and material) affectively transform the very nature of our socio-cultural/-political matrices as well as both our cognitive and sensorial relation to things.

The cognitive turn

From Bio to Noo

The basic premise of the *Cognitive Architecture* volume is that in a world increasingly populated by technologies of information and communication, the well-established Foucauldian analysis on biopolitics must be expanded to include thinking on noopolitics. While biopolitics is understood to act on body, or populations of bodies, and inscribes habits and practices specific to life (*bios*), noopolitics operates on mind (*nous*), on general intellect, mental disposition and further, within the architecture of the brain itself. The concept of noopolitics is broadly posited as a power exerted over the life of the mind, including perception, attention, and memory. Within this cognitive turn it is important to question concepts pertaining to the conditions through which world, body,

[5] This phrase is taken from an IBM advertisement on The Internet of Things, see: http://www.youtube.com/watch?v=sfEbMV295Kk (accessed May 23, 2011).

brain, and mind are coupled, influenced by, and inflected through contemporary forms of material and immaterial production and processes such as those found in our current technologically embedded age. As with discussions on the so-called information age, discourse on noopolitics impacts our thinking on socio-politics, architecture and the city in terms, for instance, of the emergence of new forms of subject-object relations whereby objects or things have taken on something akin to sentient agency, once conceived as exclusively within the domain of human cognition and action.

For decades the Foucauldian discourse on biopolitics and power has been considered a cornerstone of theories that address the formations of society and culture in relation to economy and politics in all their permutations. In architecture and urban theory Foucault's work has been well investigated, perhaps most obviously with his work on *heterotopias* as well as on Jeremy Bentham's *panopticon* as identified above. We can say that biopolitics operates through the integration and stratification of forces by institutions, organizations and various agents; while biopower flows from the constellations of power, singular or multiple, as a set of relations of forces acting on forces outside what some might refer to as the body-politic itself. Subsequent forms that the production of subjectivities has taken within the contemporary framework of what have become highly intensive and distributed networks of forces and organizations now fall within the domain of noopolitics and noopower.

Deleuze, in his 1990 essay Postscript on Control Societies,[6] argues that the *dispositifs* of power and control that once operated primarily on the body (Foucault) now operate on the mind through technologies of information and communication. With this we are no longer within the closed spaces of control as outlined by geographic or political boundaries, nor of individuals or populations; but in the open spaces of public opinion, of multiple affiliations and dispositions dispersed across the globe. We now witness not only the control of territories, but also new forms of deterritorializations (Deleuze/Guattari),[7] in other words, intensive modulations and temporal reconfigurations are both superimposed upon and subordinate extensive modalities of space. Or, as Lazzarato expresses it,

> we could say that noo-politics commands and reorganizes the other power relations because it operates at the most deterritorialized level - the virtuality of the action between brains.

In his essay Life and the Living in the Societies of Control,[8] Lazzarato outlines the continuation of the "disciplinary societies" of Foucault into the "societies of control" of Deleuze. Following Gabriel Tarde, he argues that media provide the conditions for

> the action at a distance of one mind on another, through the brain's power to affect and become affected, (which) is mediated and enriched by technology.

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6 In: *October*, Nr. 52, Winter 1992, pp. 3-7, MIT Press.

7 Gilles Deleuze and Félix Guattari, *A Thousand Plateaus*, originally published 1980 in French, translated by Brian Massumi. Continuum, 2004.

8 In: *Deleuze and the Social*, Martin Fuglsang and Bent Meier Sorensen (editors), Edinburgh UP, 2006.

Identifying the importance of memory within action at a distance, he draws a distinction between life as memory from life as a set of biological characteristics. In other words, a distinction between the bio of biopower and bio as it is held in memory; Lazzarato thus turns to the term *noopolitics* in order to distinguish the latter. Thus, the relevance of noopolitics in contemporary discourse and practice is integrally connected with memory and mind and to theorizing the relation between forces and forms of communication.

This *action at a distance* can be seen as an apparatus of noopolitics, which emerged at the end of the nineteenth century with the advent of mass media in the form of something as seemingly innocuous as the newspaper. Since its inception, mass media have served not only to benignly convey the 'information of the day' but also to radically destabilize individual perception as well as societal frameworks and political formations. In 2011, for example, we have witnessed the effects of social media as they have been marshaled in North Africa and the Middle East. Of course, such use of media technologies are equally used to both liberating and coercive ends.

Furthermore, it is important to recognize that these destabilizing events do not remain localizable but become radically dispersed, thus requiring the production of systems of interoperability. In other words, the extended distribution of information through intensively open networks of communication requires the ability to cross boundaries, to simultaneously generate integrated and dispersed systems-of-systems, which in turn produce both material and immaterial (spatio-temporal) realities that reorganize both our cognitive as well as our sensorial relation to things. Benjamin argued that at the turn of the previous century man was becoming isolated from his ability to "assimilate the data of the world around him by way of experience."[9]. While Freud, in his 1923 essay Beyond the Pleasure Principle,[10] argued that unmediated stimuli resulted in a *shock* to the psychological system. Today we appear to have become increasingly immune to the shock of encounter with the unmediated and non-localizable (action at a distance) event; nevertheless, once such issues of what we might simply refer to as the mediated and the immediate are set against notions of the bios and nous in all their permutations, matters of subject-object relations come under fire and impact greatly upon the logics of perception and experience.

The noo-sensorium

This capacity of technology, as well as that of art and architecture, to generate new modes of temporalities related to perception and experience is something that I, with my colleague Warren Neidich, have termed the *noo-sensorium*.[11] Of course, the implications of questions on the nature of such things as sensation, affect, perception, memory, and experience have long been held of import to architecture and urban practice and discourse. Such issues also once sat comfortably in the categories of vitalist and aesthetic philosophy, yet today they extend to the neurosciences and economic and political theory as well. Thus, the noo-sensorium questions how such things as politics, arts and architecture construct what Jacques Rancière refers to as a new "distributions of the sensible." These "material rearrangements of signs and images" produce real effects that define

[9] Walter Benjamin, Some Motifs in Baudelaire, originally published 1939, in: *Charles Baudelaire, a lyric poet in the era of high capitalism*, Verso, 1997, p. 112.
[10] Sigmund Freud, *Beyond the Pleasure Principle*, originally published 1923 in German, W. W. Norton & Company, 1990.
[11] 'The Noo-Sensorium' is the title given to section IV of *Cognitive Architecture*.

"variations of sensible intensities, perceptions and the abilities of bodies."[12]. Rancière also speaks of the *idée-force*, which plays a fundamental role in the generation of a new world image that operates as teleological model that is interwoven into social, political, technological and design practices. And indeed, when any "image of thought," which Deleuze situates with noopolitics, becomes a world-image then we are witnessing the effects of an action at a distance; the consequences of ambient distributed forces, for instance, which we are only able to resist once we are already subject to its affects.

In terms of architecture we are no longer dealing with the sensorium as the sum of perception seated in sensation and focused on space or the relation to objects (visual or haptic), nor on traditional modes of aesthetic representation. Time now becomes the horizon on which the contours of perception, experience, memory, and sensation are traced. Time-technologies as apparatuses and social machines reconstitute sensibilia through both affective and intellectual processes. Here we must consider not only the processing of data (immediate/mediated) in relation to the body (active/reactive) as such, but also the processing of data within a mind that is increasingly directed toward the future (active/prognosticating). Perhaps a comparative example from film may serve to easily illustrate some of these issues in relation to the bio and the noo respectively: David Cronenberg's 1999 film *eXistenZ* mapped the new technologies of information and communication upon biotechnologies giving us a futuristic projection of an intensive virtuality immersed in a fully sensorial environment. This *novum*, which produces, in fact, a "psychic reality," as one scholar has described it, can be understood as the[13]

> interface of the human psyche with bioelectronic devices, [...] a sort of analogue to Freud's notion of drive (*Trieb*) [...] conceived as an entity bridging the mental and the somatic, the interface of mind and body[.]

If *eXistenZ* can be seen as an example of a cultural *bio*-imaginary, then the more recent example of Christopher Nolan's 2010 film *Inception* exemplifies the current *noo*-imaginary. *Inception* conceives of neuro-technologies capable of remapping minds within minds, dream convergences, constructions of perceptual and sensorial realities within a scripted landscape of neruo-architecture, leading ultimately to the fabrication of memory. Here the concept of minds acting on minds (action at a distance) resonates.

Administering attention

In addition to issues that impact on questions of sensible perception – of the noo-sensorium as such – and concepts that address the reconfiguring of our relation to time and space, it is also imperative to rethink the concept of attention. In other words, the information age must be seen as directly related to new forms of "administering attention."[14]. By this we should understand that language and culture are powerful immaterial and material forces in the sculpting and administration of both experience and cognitive responses. As mentioned above, Lazzarato identifies memory and attention as the key components in understanding how noopower exerts

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[12] Jacques Rancière, *The Politics of Aesthetics*, Continuum, 2004.
[13] Teresa de Lauretis, Becoming Inorganic, in: *Critical Inquiry*, Summer 2003, p. 547.
[14] 'Administering Attention' is the title given to section III of *Cognitive Architecture*.

force in societies of control. Here we find that it is the incorporeal dimension of bodies that are fixed in the crosshairs of the forces acting on our contemporary life-world. We might consider how institutions and organizations concerned with the exertion of power deploy means to hype up selective nodes of information that accentuate administrative power over not only attention and memory, but also desire. Of course there is also a well-instantiated economic practice that puts these theories to work; I am naturally speaking of what is currently understood as the *attention economy*. Consider, for instance, how commodities are now linked together as branded networks that intensify their desire quotient. The so-called global market place utilizes media and computational technologies to generate powerful and complex networks of attention that go so far as to define both political and aesthetic regimes. Here we must recognize highly complex sets of tangible and intangible forces and factors that are simultaneously integrated and dispersed in the production of new political-aesthetic cosmologies and socioeconomic ecologies, networks of relations, and evolving subjectivities. From the neuroscience perspective, Scott Kelso has suggested that[15]

> active, dynamic processes like "perceiving," "attending," "remembering," and "deciding," that are associated with the word *thinking* are not restricted to particular brain locations but rather emerge as patterns of interaction among widely distributed neural ensembles and in general between human beings and their worlds.

Perhaps we should consider that phrase in the IBM add as more than mere marketing cleverness, but a factual description of a planet that has, indeed, grown a "central nervous system."

Actors & agents

With the cognitive turn we therefore must pay special attention to rethinking the concept of agency and to investing in a different reading of proximity and distance, of coordinates (co-ordinations) of spatio-temporal and cognitive events. The renowned scholar on what has been termed *surveillance society*, Katherine Hayles, critiques the importance of retaining individual privacy in societies that presume freedom as a fundamental political tenet. As with Lyotard's *Report on Knowledge*, Hayles questions *who* it is that actually has access to, as well as the control of information. Privacy, she argues,[16]

> means *having access to data* that has been collected on us by interested parties; it means *having control over* how data about our private lives is used and by whom; it means *the right to establish boundaries between public and private spaces* that are lawfully enforced and respected by everyone, including functionaries at every level of government, ... and at every level of corporate activity, from local stores to transnational databases.

With this critique it is necessary to investigate the consequences of new forms of dispersed and embedded technologies, ones that also require that we fundamentally rethink our concepts of agency.

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[15] J. A. Scott Kelso, Metastable Mind, in: *Cognitive Architecture*, p. 131.

[16] N. Katherine Hayles, Waking up to the Surveillance Society, in: *Surveillance & Society*, Volume 6, Nr. 3, 2009, pp. 313-316. This short paper provides a commentary on a report commissioned by the United Kingdom's House of Lords Constitutional Committee in 2009, entitled Surveillance: Citizens and the State.

In *Cognitive Architecture* Jordan Crandall contributed a paper that I feel is of particular import to this discussion. In Movement, Agency and Sensing: A Performative Theory of the Event, Crandall provides a virtual lexicon of the terms and conditions within which both human and machinic agency interface, interact, interoperate, inter-immerse. Through techniques of tracking and tracing codifications of movements and cartographies of surveillance are produced. Further, new forms of actors/agents are being created through the use of such things as data mining, sensors, processors, and filters (locationing of agential articulation) such as NFC (Near Field Communication) and RFID (Radio Frequency Identification) technologies. Crandall writes that[17]

> all manner of new forms of agency begin to populate the urban world in ways that challenge the ontological centrality of humans.

It must be said that there is also something at once both animate (vital) and inanimate (inhuman) in this reading of agency of apparatuses and prosthetic devices of extension that both expand and contract human and non-human perception and action into realms that even the imagination is only now just able to touch. The sensorium is here related to something more than sensory faculties, and attention belongs to something other than the cognitive capacities of animate bodies. Of course, a body is already in itself a system of distribution and much like the agent in Crandall, Deleuze argues that a body can be almost anything; it can be an animal, a body of sounds, a linguistic corpus, a social body; to which we might add the internet as a body of networks, an architectural work, or an urban strategy. Yet, in all cases a body must be defined as a unity of parts, parts held together relationally and having a capacity to affect and be affected both internally and externally. Affect, in this account, is seen as vitality or a pure potentiality. And further, with Crandall, it is

> an undifferentiated, moving kaleidoscope of sensations and states, [...] a form of activation that is not necessarily available to the conscious mind, but is shared nonetheless by the synaesthetic perceptual faculties of the body substrate – including the proprioceptive [and] the visceral.

With reference to the above, it should be understood that, as such, agency acts through combinatory practices, assemblages that combine generally accepted ontological categories as well as expand deep into the substrate of the noo-sensorium and act on the dynamic and inventive realms of the cognitive (*noo*) imaginary.

Standardization and interoperability

Elsewhere[18] I brought the above questions of agency to bear on what has been termed the *Internet of Things* (IoT): ambient technologies working through distributed and intensive flows of ubiquitous data/information exceeding our understanding of the Internet as a distributed system of programmable and locatable data and information. Crandall writes that[19]

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[17] Jordan Crandall, Movement, Agency, and Sensing: A Performative Theory of the Event, in: *Cognitive Architecture*, pp. 403 -429.
[18] Deborah Hauptmann, Noo-Architecture and the Internet of Things, in: Archis, issue: Internet of Things, Summer 2011, pp. 16-19.
[19] Crandall, Movement, Agency and Sensing.

> program is an actor-attribute that allies with language and rhythm to magnify the potential for standardization. [...] Program builds not simply on differential relation but structural similarity – protocol, frequency, synchronization – registering and introducing commonality [...] or the setting forth of interoperability between organisms: the mutual orienting of domains as a precondition for communication and affiliation.

Of course, architecture and urbanism inhabit the same spaces and temporalities that characterize these new modes and relations; their presence also possesses the potential to bend and contort the very systems in which they operate. Architecture too often tends to be considered as autonomous, disengaged, and distanced from life as some form of hermetic (design-centric) endeavor. Quite the opposite is true; architectural technologies are embedded in the interwoven fabric of social, political, economic, psychological, historical, and spiritual relations. Architecture has created its own set of *dispositifs* that provide for the smooth realization of new and diverse networks into planned conditions of the built environment. Put differently, architectural and urban processes, procedures, and products commingle to form complex systems of recurrent and recursive circuits, which, in the end, help produce novel forms of networks that empower the imagination and constitute the cultural landscape with new objects and subject relations.

Here we might point to the example of South Korea's Song Do City, an urban experiment in the ultimately *programmable* of environments; with built-in ambient intelligence (AmI), this experiment evinces a direct impact on ethos, city and life.[20] Ambient technologies involve apparatuses that are inherently capable of eluding reflective mediation or capture. Thus, can we now speak of not only *societies of control* but also *cities of control*? Such contemporary strategies make Foucault's critique of the bio-political apparatus of surveillance in the form of Bentham's Panopticon (inscribing habits of behavior upon the body of the prisoner) seem almost benign. The scientist and science fiction writer David Brin writes of technologies' advance on urban formations as potentially developing in two forms: the City of Control (ubiquitous, coercive) and the City of Trust (transparent, empowering).[21] There can be no doubt that new techno-centric urban experimentations incorporate both empowering and coercive means and distributions of relations of forces; biopower and noopower, operating through and within *noo-architecture* and what we might now well term *noo-cities* as well. With many architects we are now witnessing a willingness to embrace these emerging technological apparatuses; the word *inevitable* appears not as a watchword but as an enlightened acquiescence. What in our previous ontological models was seen as a leap of faith to metaphysical spirit now appears as a leap of faith to a digital virtual-real.

[20] A quick web search on Song Do City shows it promoted as a green city while the actual effects of the ambient technology aspect of this urban experiment is submersed within the propaganda of safety and convenience (what we might refer to as the dominant ideology in this age of prevention).

[21] David Brin, *The Transparent Society: Will Technology Force Us to Choose Between Privacy and Freedom?*, Perseus Books, 1998.

In closing

What is striking about socio-technological transformations is that in each instance, recognizing the shift revolves around re-thinking both subject/object and spatial/temporal relations that subsequently reorganize the very basis of our ontological and epistemological frameworks. And more importantly, as mentioned above, in developing an understanding of these shifts as they are inherently related to new forms of socio-political matrices of power and power relations. Further, it has become clear that in addressing contemporary social theories and cultural practices within the broad framework of the so-called information age, that the relation between society, culture and the brain cannot be ignored. With this the brain must be understood not merely as the privileged metaphor for consciousness, or cognition as theorized in the philosophy of mind; but the brain as examined in contemporary neurosciences. Here we must understand the manner in which the brain is transformed through external influences, and conversely, how the emerging knowledge on the brain informs both the limits and possibilities of our interaction with and effect upon our world. And although the limits of this chapter do not provide opportunity to discuss the relation between brain and culture in detail, I can assure the reader such issues do indeed underpin this work.

I believe it remains necessary to develop a better theoretical understanding of the emerging conditions that are currently generating new fields of research and elicit forms of power and relations of power within the context of economic, political, social, aesthetic, and cultural contingencies; a search that is paralleled by many scholars and scientists who, in various manners, conduct research into our cognitive capacities in general, and the brain specifically, whether considered as psychological, physiological, biological, or neurological. It is, in fact, by virtue of these emerging trans-disciplinary inquiries and practices that we may confidently claim that we are currently in the process of another turn in modernity, that is, *the cognitive turn*.

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