

# INTERFACE AND ACTIVE SPACE

## Human-Machine Design

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"Early in the next millenium your left and right [cuff links](#) or earrings may communicate with each other by low-orbiting satellites and have more power than your PC." Have you ever wondered what your earrings would say to each other if they could have a confidential conversation? I have to confess I hadn't. One of the endearing things about Nicholas Negroponte, who conjured up this image, is that he hasn't either. What fascinates him, in [Being Digital](#) (1), is the possibility of the connection. Why bother with gossipy cuff-links? Because they would connect. The titillation is less in the gadget itself, or in the goal of the gadgeting, than in the joy of connection. Negroponte is animated by a connection fetish that is refreshing in its lack of moralizing about what we should do in the future. Negroponte's Media Lab is so busy manufacturing for us. For Negroponte, it is never really a question of goals or utility. [Being Digital](#) is all about interface, for interfaces' sake. Why?

Because the future, as Negroponte sees it, is information overload. The human body will be flooded with an impossible richness of information, to a degree far beyond the ability of its perceptual apparatus and nervous system to receive and sort. Delivery on demand is already passé before it has become a reality. In Negroponte's future, information will be delivered in parallel, at all times, rather serially and on demand: "anything, anytime, anywhere" (174). All the world will be rolled up in data, its now digitalized mass threatening to suffocate the unprotected body, swamped by a downpour of pure availability. The role of the interface is to filter the bombardment. "Personalization" is the watchword. The filtering interface Negroponte evokes would simulate human-to-human contact as much as possible, favoring voice command and integrating recognition capability for non-verbal cues. Each human body would surround itself in a custom-tailored double, a machine bubble composed of an intelligent network of "digital butlers" (152) attuned to all the particularities of its "master's" moods and movements. I will program myself into my "butlers." The "butlers" will act for me. They will be my delegates in the infosphere. They will brave the chaotic waters of availability to search, sort, select, and process for me. They will be intelligent, self-adapting, "learning and developing over time" (155).

Negroponte dreams of an externalization, in a technological double-bubble, not only of intelligence, but also of personality and choice, made infinite, and infinitely fast. Could the transfer of properties be one-way? "Your face is your

display device," he tellingly informs us (129). You human, "me" machine. Make "me" redundant, the prophet cries (150). Make me redundant, for the infinity of selection. "Redundancy is good" (98). The transfer of properties would go both ways, blurring the boundaries between master and servant, human inside and machine outside, in a continuous feedback loop. "Being digital is almost genetic" (231). Choice and processing might indeed become infinite. But they would also be circular, and automatic. Who is in control in a redundancy of doubles second-guessing each other? The "inter-" of gossipy earrings in confidential conversation bypasses the "-face" (not to mention the brain behind it). Being Digital's "personalization" of interfacing ends in de-facing. Post-humanization through "personalization." Human machine design. The dream of an interface with "the ability to model you" (155). The human-designed machine designing the human.

Design for what? For profit. In the future information economy, Negroponte implies, the products will be primarily "immaterial."<sup>(2)</sup> The interface will cull from the infinity of available information, distinguishing the noteworthy from the banal, and detecting exploitable patterns. Product development will be a matter of organizing raw information material, repackaging it, and reselling it as a finished product. The most profitable "finished" products will not really be finished at all. They will be information repackages that allow consumers to repackage their own information--information products for information production. Information squared. What will be sold will be capabilities for producing rather than utilities or use-values (end-use objects for consuming). The product will be a dissemination of the capability to produce information by means of information, and in the producing, to profit. In other words, the interface will cull information in order to intensify and transform it, from a commodity to a form of capital. Information circulation will directly generate surplus-value, blurring the distinction between circulation and production, and supplementing, if not supplanting, Marx's labor-value with information-value.<sup>(3)</sup> The fetish for connection connects to a fetish for circulation--of a kind that appropriates to itself the properties of value-production that in earlier capitalist formations was reserved for human labor. The "motor" of profit is encapsulated in the flow of information and its transformations, which become the focus of joyful fascination, in and of themselves. It is not so clear that profit, encapsulated, can be said any longer to be a motive, or the "end" of the process. It is now in the middle, between information repackagings. It is more like a propulsive moment in the perpetual, intensifying, self-turnover of information--a metamorphic stage in its life-cycle. The interface matters to the extent that it forms a node in a self-motivating circulation producing a backwash of profit, as a by-product of its own intensification and perpetuation. The interface is pure means responding to pure availability: pure process. Machining. Negroponte is silent on what we should do in his future because use-value and goal-orientation (in this case, profit) are lost in the swirl. They take backstage to a self-organization of unfettered process: to a machining of human activity.

Implicit in Negroponte's musings is a particular figuration of the self in its surrounding space. Space figures as a formless mass of data points (bits) in parallel motion. These points may have made sense in the particular contexts from which they were digitally extracted. But as a mass, in electronic profusion, they lose all meaningful orientation, arriving everywhere together. Information is freed from its anchorage in meaning, much as means are unfettered from their subordination to ends. The space of the infosphere is a homogeneous space of aimless, instantaneous delivery of everything in all directions simultaneously. It has one dimension: raw data, the matter filling cyberspace, a matter that is inert by virtue of overactivity. The human body risks drowning in the unformed sea, if it does not select from the incoming flow, process the selected material (square the information), and direct a transformed flow back out into space in a calculated way (a way calculated to produce profit). The body must transform raw data-matter into profit-by-information squared. It must order and [organize](#), it must form the formless, but to do so, it must shield itself from immersion in it. The materiality of the body recedes behind a digital bubble of servo-mechanisms which reembody its ordering activity, externalized; which rematerialize human thought, as programmed. The activity of the body externalizes its self in the mediating materiality and coded protocols of the adaptive interface. From there, its orderings transmit into the infosphere. The interface is a relay point in the dissemination of human ordering activity into space. Homogeneous space, at first invasive and threatening, is transformed into a realm of expansion onto which human projects its self, in coded-thought form. The abstracted activity of the human body and the matter within which it acts become isomorphic--formal repetitions of each other. All the weight of their former materiality is taken on by their mutual transformer, the interface. The body disappears behind a technological shield, becoming a backstage director, an organizing desire, or will, in self-protective hiding--a defensive self informing inert matter in homogeneous space, forming it in its own likeness. Except that it loses its likeness. When it looks at its face in the mirror, it sees the interface, the display device. The materiality of its body and the body's organizing capacity (its desire, expressed as a will to mastery, coded as a thought-form)--are neutralized in the transmission of ordering back into that space. The human sows its self in formation. (In)formation for (in)formation's sake, in perpetual self-turnover. Pure, controlled and controlling, externalized form, mirrored in the displaced matter of mediation, interacting with itself. Pure availability + pure means = interactive form - matter (lost in the shimmer of self-mirroring).

All of this is tiresomely Cartesian: a directorial self esconced in a problematic body which it overcomes with the aid of programming and technology in a way that spiritualizes matter, and all of space, by conforming them to its will. A familiar Cartesianism, underpinning many a discussion of cyberspace. What distinguishes Negroponte's from run-of-the-mill versions is the lustiness with which he looks upon his creation, and pronounces its "redundancy" "good." The "goodness" of redundancy places a tacit seal of approval on the machinic

conversion--the viciously circular point at which mastery of one's space converts to automatic pilot, and control converts to compulsion, in the sweep of a process that has run away with itself. It is a recognition that human activity cannot stamp its form on lost matter without losing itself; that it cannot spiritualize matter without spiriting itself into matter. Me human, me machine. "Good." At the Negropontean interface, the human merges into the hard materiality and adaptive programming of the techno-connection, the interface at which it materializes as insistently as it self-abstracts, in an unresolvable dialectic. Human-machine, without "me"? "Good." What distinguishes Negroponte's Cartesianism is the cheerfulness with which it communicates its redundant future as repeated failure.

When the question of profit motive was raised above, it was not to make a point about greed. It was to make a point about a desire for the future that starts by taking profit as its end, and ends with information as a means; that starts by personalizing its machines, and ends up machining its personality; that encapsulates its motive force, and the form of its self, in an auto-productive process greater than itself. The point is that a futurological desire, like that expressed by Negroponte in [Being Digital](#), is not just about gadgets. An expressed desire for the future envelops a possible world: a potential space of a particular kind, inhabited by a particular self-form, whose ostensibly goal-oriented activities take on a specific spin. In other words, it is effectively ontological--a mode of being in germinal form (a becoming). Likewise, when the question of defacing and dehumanization was raised it was not to teach a moral lesson about human integrity in the face of its own chatterbox inventions. The point was that when human desire invests connection and circulation without renouncing control, it falls into a double bind. A body that succeeds in controlling connective and circulation by externalizing itself in it, loses control in exact proportion to which it gains it. In doubling and bubbling, the more controlled the process, the more the process controls. In other words, a techno-desire for the future envelops a potential politics--a (self-defeating) system of power in germinal form.

The computer-assisted design practice of New York-based architect Greg Lynn ([FORM, The Renewed Novelty of Symmetry](#)) also envelops an ontology and a politics, but in very different ways from both Negroponte's reluctantly hyperactive Cartesianism, and from the more classical Cartesianism of traditional graphics and design software. In computer-assisted design, the screen space is most often thought of as a virtual sheet of paper. Its two dimensions stretch to three, with the addition of perspective. The screen space is treated as a preexisting three-dimensional matrix into which figures can be plopped. Pre-plop, the space is empty. Filling it doesn't change its spatial characteristics. It is inert. Its three dimensions are invariant axes against which the figure can be plotted and measured. This is a Euclidean space of geometric projection. A figure is projected into it, then is varied against the constant backdrop of the axial matrix until a pre-conceived result is achieved. The self

inhabiting this space is once again a directing will, imposing a formation, the development of a figure, on inert space. The result of the design process is a simulation of the object to be constructed in a separate, but similar, "real" world space, also conceived as an inert three-dimensional matrix. For example, the result might be a simulated house that a client can be "walked through" on screen. The simulation works because it resembles the ultimate product. The relation between the on-screen and off-screen objects is one of formal analogy. As customarily practiced, "digital" design is entirely in the thrall of the analogic.

Greg Lynn starts from a different space. He tactically misapplies to architectural design animation software developed for generating special effects for Hollywood movies. The interest of the program he uses (Metaballs, by Wavefront Technologies) is that it allows the designer to program a non-Euclidean screen space. Lynn starts with "blobs."<sup>(4)</sup> The blobs are active elements or "primitives" which combine to generate their own space. Each blob is internally differentiated. It is assigned a circumference, a mass, and a corresponding force of attraction. The force of attraction defines a field of influence outside the perimeter of the blob, and that field is in turn differentiated into zones. Closest the perimeter is a zone of fusion. Any blob entering it will combine with the first blob to form a larger blob. Beyond the fusion zone is a zone of inflection, the area within which the attractive force of the blob will alter the shape, and therefore the field of influence, of a neighboring blob. Put a number of blobs together, and their differential influences on each other produce unpredictable reciprocal deformations. Each blob is a differentiated subfield with a larger field of blob combos. The larger field is not an invariant, containing matrix. It is a space of reciprocal variation, whose characteristics shift as the blobs move about, combine, and inflect, the complexity of their interactions preventing them from settling into an equilibrium. This is an active space composed by forces of interaction between dynamic elements. The variations that occur within it are variations of it. The global characteristics of the space express the collective effects of the local components, without exhausting their dynamism. The space as a "whole" is not reducible to its blob-"parts," which retain their local properties in and through their agglomeration. The blobs are enfolded in their globality, rather than being contained by it or reduced to it. The global is an overall effect of an irreducible heterogeneity. That overall effect is in continual variation as its components tirelessly interact. The "whole" is not a whole at all, but an infolding-expressive field of variation. The self-activity and heterogeneity of this space is in stark contrast to the inertness and homogeneity of the Euclidean matrix, whose invariant axes act as a container for whole figures that are the sum of their parts and are varied, as wholes, through the intervention of a force that enters its space from outside and projects transformations into it. The forces of the blob space are endogenous; those of Euclidean space are exogenous. The blob is also a space of higher dimensionality. If each independent variable constitutes a dimension, the blob space has five

(circumference, mass, force of attraction, zone of fusion, zone of inflection). If each blob is considered an independent variable, the overall space has as many dimensions as there are blobs ( $n$ ), times five. Add to that the fact that the Euclidean matrix can still be projected into the blob space, and its dimensionality rises to  $n \times 5 + 3$ . Now plopped into the blob space a Euclidean matrix that contains a three-dimensional geometrical figure. The figure --and its matrix--are deformed by the dynamic interaction of the subfields composing the overall space. The variation of the externally supplied Euclidean figure registers the global effect of the endogenous variations. Rather than imposing a form on the blob-space, the transformation of the figure registers the singular dynamic of the self-differentiating field. The deformation of the figure expresses geometrically a global effect of the blob space (which envelops an infinity of potential global effects of this nature). The figure expresses the many-dimensionality of blob space in three dimensions, without eliminating that many-dimensionality. And it expresses the self-differentiation of the field as a transformation of a figure that remains the same figure across its transformation. It translates the irreducible self-difference of the field in continual variation, into a change in the same. Three-dimensional geometrical form and its attendant laws of identity are retained by the blob space, but with a difference: they are retained on the level of variable effect, rather than as a conditioning matrix standing as an eternal formal cause. In relation to the blob space, the figure and its matrix are dependent variables. The independent variables of the blob space are expressed, on the "whole," in their collective effect, in a dependent variation. Their independence translates into a dependency, in the same movement that links them, without reducing them, to a lower dimensionality and laws of identity that are not their own. The simplicity of the figure co-exists with the complexity of a field, of which it is a derivative and limited expression. The limitation of the Euclidean matrix and the figures it contains is no longer founding or grounding. They are derived. Their closure has been made a dependent variable of a dynamic openness; their relative (deformed) constancy, an effect of continual variation.

Into the constitutive openness of the blob space, forces as well as figures can be plopped. Take for example a view from window. Normally, a view is thought of in geometric terms, as a perspective defined by a breadth and depth of vision: a viewpoint for a Cartesian subject. Think of it instead as a force of attraction: for a libidinal self. A good view attracts clients, and therefore their money, and when the money changes hands, it attracts use-values and indulgences. Now, by analogy, translate that force of attraction of the view into the interacting forces of attraction of a population of blobs. Of course, the attractions of blobs for each other bears no resemblance to the attraction of a client for a view. The "analogy" is fraught with indeterminacy. The reprogramming of the blobs to repeat the force of a view is not just a "translation" of the view into a different medium. It isn't a projection, and the result is not strictly speaking a simulation. It is a reinvention of a view as something qualitatively different: a blob mob. The analogic reinvention leaps

across a dissimilarity, to connect two disparate situations--that of the digital design-space on the one hand, and on the other the shared space of the client's and architect's attractions, as converging toward the built-space-to-be of a room with a view. It is disjunctively connective. In its connective aspect, the act of reinvention forms a bridge. What crosses the bridge is a force, not a form. Since force is by nature invisible and dynamic rather figural, the reinvention could not obey laws of resemblance and identity if it tried to. It is at once arbitrary (unregulated by constant laws of formal relation) and astute (calculated to generate a usable effect). The pragmatism of the connection cannot erase the fact the "bridging" is a relation of non-relation, a disjunctive linkage between levels that retain their heterogeneity: a built-in view and a self-varying blob space. But neither is it bothered by that fact. The whole point is that the "analogy" is part of a pragmatic process of creation.

Now that the force of attraction of a window has been reinvented as a blob mob, plo in a figure again: the floor-plan of a house. The outline of the house will be deformed by the multidimensional blob-double of the Cartesian view. The house will deform to the force of the blobbed view. If the view is considered a desired "quality" of the house, then what the designer has done is to make quality visible, in the form of a geometric transformation. This making-visible is not a representation according to general conditions of formal analogy. The analogy is between forces, and the making-visible is an unfolding of a singular dynamic that, while it is pragmatic, is not entirely predictable. Now take the result of this force-fed qualitative deformation, play with it, and come up with a blue-print. It is clear that another gap opens between the result of the computerized design procedure and the final design. The deformed figure cannot be directly used as a design element, marked as it is by the singularity of its forced deformation. It has to move back across the gap from the blob space of which it is a derivative to the building space in which it will have its generic existence as a house. It has to be translated back into a recognizable variation on generally acceptable living space, or it won't sell. This translation is achieved, once again, by analogy--leaving room, once again, for arbitrariness. For creativity. The digital design procedure is bracketted by analog gaps bridged with invention.

The interaction with technology, and the overall process that the digital design is a part of, is radically different in Lynn's practice than in Negroponte's futuristic gadget-dreaming. Interface is not obsessed over, because every aspect of the process is a transformative variation on every other aspect of it, so there is no privileged site of mediation--there is no mediation, only mutual transformation. The transformations cross gaps that transmit or express force, rather than repeating form. The human doesn't get caught in the double bind of control, because the space with which it works is entirely different. It is highly differentiated, and that heterogeneity is respected. There is no either/or. No: either mastery or control. No: either me, human, or you machine (or was it the other way around?). No: either homogeneous or isomorphic. No: either

immersion or imposition. No: either formlessness or form. No failed imperialism of the human over the machine. What there is instead is co-adaptation. All of the different levels in play are retained--including reductive Euclidean space and Cartesian control. But everything is retained together, in a way that plays everything off against everything else, so that what is retained is retained only as it reciprocally differs. Human-directed constraint and imposition are retained in the programming of the blobs. But human creativity is also retained, in the gaps across which the analogical doubling of forces must leap. Constraint and creativity are not in contradiction, but in cohabitation. One does not ground or contradict the other. Rather, they relay one another. Constraint is no longer a threat from the outside, or in response to that threat the willful imposition of a self-same form onto that outside. Instead, constraint is the programming of interactions between forces; from those interactions, differentiations unfold. Creativity is no longer a property internal to the self. It is an event that is not entirely decidable, a tactical bridging of an unbridgeable gap between qualitatively different spaces that stand in relation to each other as mutual outsides. The human is not a bubble, an interiority facing its outside, seen as an other to be remade in human likeness. It is the interval, a relay, between outsides. As for the profit motive, it is not encapsulated in a vicious circling of (in)formation for (in)formation's sake. It is no longer assumed, but neither is it moralized about. It is acknowledged as an enabling constraint on the process, and as a necessity of survival. It relays back into the creative process and out into use-values. It is allowed content. For content is no longer in opposition to form, any more than form is in opposition to force. And digitality is no longer in opposition to analogy. And means are no longer in opposition to ends. And closure to openness. And interiority to exteriority. And resemblance to difference. And face to interface. And human to machine. And use-value to information-value. And simplicity to complexity. And production to circulation. They are all in transformative co-adaptation to one another, in a space of non-exclusion. They are all stases in a continual variation that transformatively links their differences. Everything is in relay, and every relay expresses, retains, and varies a difference in nature. There is no purity. Even space itself differs in nature, its primary differentiation being between extensive (inert, matricial/containing) Euclidean space, and intensive (active, infolding/expressive) blob-space.(5)

This is completely different kind of connectionism, featuring a different kind of circulation, producing a different becoming. Lynn's design process fosters a reciprocal becoming of a heterogeneity of elements whose heterogeneity is affirmed. Negroponte's salemanship-for-mastery is a reductive double becoming, of one thing in the likeness of another, and vice versa, until all that is left is the resemblance, abstracted and materialized. Negropontean becoming is a dialectic of expansion caught in the double bind of control. Lynnian blob-becoming is nondialectical, openly continued. The modes of being and power it germinates are worth exploring, on the eve of the age of interface.

## NOTES

1. Nicholas Negroponte, Being Digital (New York: Alfred A. Knopf, 1995).
2. Maurizio Lazzarato, "Le cycle de la production immatérielle," Futur-antérieur, no. 16 (1993), pp. 111-120.
3. Marx summed up early capitalism, in which the flow of money was subordinated to use-value, in the equation C-M-C'--the replacement of an old commodity (C) by a new commodity (C'), mediated by an exchange of money (M). In mature capitalism, commodity use-value is subordinated to capital accumulation: M-C-M'. The aim is profit, the production of a new and greater sum of capital through the sale of commodities. In the information economy, the profit-producing exchange of money for commodities is again subordinated, this time by information as a higher-order form of capital: I-(M-C-M')-I. The aim is still profit, but profit is encapsulated in capital's information-form.
4. Greg Lynn, "Blobs," Journal of Philosophy and the Visual Arts, special issue on Complexity: Architecture/Art/Philosophy, 6 (1995): 39-44.
5. Greg Lynn, "Architectural Curvilinearity: the Folded, the Pliant and the Supple," Architectural Design, special issue on Folding in Architecture, 102 (1993): 8-15.