

Interactivity and Agency in Real Time Systems

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ABSTRACT: In this paper, I look at theories of art that focus on art as *doing* rather than art as *object*. I foreground the 20th century avant-garde's emphasis on flux, indeterminacy, and audience participation and the role that Cybernetics and Systems Theory played in Jack Burnham's prescient writings on Real Time Systems. Whereas some see novelty in the reactor *activating* or "bringing a work into being," I am more interested in systems that are authentically interactive; that is, *conversational*. I then aver that a precondition for agency is second-order cybernetic systems that have "underdetermined goals," and "I/you-referenced" interaction. These Real Time Systems allow participants to build their own sense of agency in *Networked Art*.

KEYWORDS: agency, conversation, cybernetics, interactivity, networked art, real time systems

"In place of symbolic communication, I place all of the emphasis on agency, intention, causation, result, and transformation. I view art as a system of action, intended to change the world rather than encode symbolic propositions about it."

– Alfred Gell

"In judging a work's politics, we should not look at the artist's declared sympathies, but at the position that the work occupies in the production relations of its time." – Walter Benjamin

INTRODUCTION

In the late 1960's, theorist and critic Jack Burnham wrote, "we are now in transition from an *object-oriented* to a *systems-oriented* culture. Here, change emanates not from *things*, but from the way *things are done*." (Burnham 1968) Burnham viewed art as an information processing system; he thought of artists as analysts of data and creators of code, and art institutions as "metaprograms," transformers of "preferred information into value."

(Burnham 1969: 136) Burnham asserted that art did not reside in objects but in "every experiential mode," and that making, promoting and buying art are real time (everyday) activities, unlike the 'idealized' art that metaprograms enfranchise by removing it from the flow of time. Predicting that digital technologies would become enmeshed in our everyday activities, Burnham averred that "(A)n increasing amount of thought will be given to the aesthetic relationship between ourselves and our computer environments – whether or not this relationship falls into the scope of the fine arts." (Gere 2005: 154)

Burnham agreed with John McHale's prediction that art would become "temporal immersion in a continuous contextual flow of communicated experiences." (Burnham 1969: 136) Although Burnham suggested that the important artist would "liquidate his position as artist *vis-à-vis* society," (Burnham 1968) he also declared that artists are "deviation amplifying" systems who reveal "psychic truths at the expense of existing societal homeostasis." One of the artist's responsibilities would be to magnify how "technology uses us." (Burnham 1969: 146)

In developing his theory of art, anthropologist Alfred Gell averred that 'art objects' should be replaced with *persons* or *social agents*. Gell's theory, in which art "merges seamlessly with the social anthropology of persons and their bodies," was built on the notion that art is *doing*, and not an object's semantic aesthetic properties. (Gell 1998: 5, 7) Thus, art is the "social relations in the vicinity of objects mediating social agency... between persons and things, and persons and persons via things." He wrote:

"The 'action'-centered approach to art is inherently more anthropological than the alternative semiotic approach because it is pre-occupied with the practical mediatory role of art objects in the social process, rather than with the interpretation of objects 'as if' they were texts." (Gell 1998: 6, 12)

Gell avoided framing his examples as “works of art” because to discuss them as such inferred an *a priori* institutional definition: “An object which has been ‘enfranchised’ as an art object, becomes an art object *exclusively*, and can only be discussed in terms of the parameters of art-theory.” In summary, Gell’s theory was premised on the idea that the “nature of the art object is a function of the social-relational matrix in which it is embedded.” (Gell 1998: 12)

Burnham and Gell’s ideas are similar in that both saw art as more than objects – as *processes*, as *doing* – and both saw the persons responsible for *doing* as part of a much larger cultural system in which these *doers* were not exclusively “artists.” They both believed that the role art institutions played in valuing objects limited our notion of what art could be; and that *institutional art* is authoritative and prescriptive. Neither Burnham nor Gell was alluding to *Networked Art*, yet both presaged many of its attributes, including responsiveness, relationality, and sociality.

Writing in 1988, between Burnham and Gell, theorist Bill Nichols averred that the liberating potential of computer systems and networks is in how they allow us “to see ourselves as part of a larger whole that is self-regulating and capable of long-term survival.” At the time, Nichols acknowledged that this larger whole remained dominated by the hegemony of the art *institution*, but that “the very apperception of the cybernetic connection, where system governs parts, where the social collectivity of mind governs the autonomous ego of individualism, may also provide the adaptive concepts needed to decenter control and overturn hierarchy.” (Nichols 1988: 640)

Since the rapid development and wide-spread use of the Internet since the 1990s, the turn away from the art object has been facilitated by *network culture* which – especially with the rise of mobile computing and social media in the 2000s – is less the product of discrete processing units (individuals or desktop computers, for instance) than of the networked relations between them; between people, between machines, and between machines and people. (Varnelis 2010) The network as an organizational paradigm has supplanted that of centralized hierarchy, including the centralized hierarchy of the art system. “As long as museums refuse to acknowledge this transformation, they will remain in a peripheral and potentially obsolete role in relation to the most advanced aspects of contemporary art.” (Burnham 1969: 140)

1. Art as *Doing*

Today, the terms “Interactivity” and “Participation” are used interchangeably, and their meaning has, unfortunately, been diluted by commercial (web 2.0) marketing techniques. In fact, both have deep roots in the

twentieth century avant-garde. *Participation* – which is fundamentally social and has been around as an artistic strategy for almost one hundred years – began with Dada and Futurism, and continued through Fluxus, some of the early telecommunications experiments, and on through *Networked Art*. Participation implies a political stance, an attempt to break down the culturally determined distinctions between art and life, thereby critiquing the *institutional* function of art. Collectively, the avant-garde emphasized flux, indeterminacy, and change. It asked: Does an artist have to *make* an object for it to be a work of art? Does an artwork have to be an *object* at all?

Many of Allan Kaprow’s “Happenings” (environments/ events) of the early 1960s were, for instance, “generated in action.” (Kaprow 1961: 86) As such, they were open-ended, fluid, improvisational and ephemeral; and, as collaborations, they were “relations among individuals.” (Drucker 1993)

Doing theories of art shift the focus from the *aesthetics of art objects* to the *aesthetics of relationships*, between people and their environments. “The organic connection between art and its environment is so meaningful and necessary that removing one from the other results in abortion.” (Kaprow 1961: 85)

For Burnham, the artist would become the “maker of aesthetic decisions.” He wrote:

“The continued evolution of both communication and control technologies bodes a new type of aesthetic relationship, very different from the one way communication for traditional art appreciation as we know it ... [t]he ‘aesthetics of intelligent systems’ could be considered as a dialogue where two systems gather and exchange information so as *to change constantly the states of each other.*” (Burnham 1970: 96 Burnham’s emphasis)

In his 1970 exhibition, *Software, Information Technology: Its New Meaning for Art* – which he curated for the Jewish Museum, New York – Burnham was interested in how dialogue *evolves* between computer-human systems, and he encouraged the public to personally respond and ascribe meaning to experience. (Shanken 1998) Though the system *is* a physical presence, “it does not maintain the viewer-object dichotomy but tends to integrate the two into a set of shifting interacting events.” Thus, Burnham advocated that artists create *responsive* systems, which would “gradually diminish the distinction between biological and non-biological systems.” (Burnham 1968B)

2. *Doing* in Real Time Systems

Burnham’s late 1960s theories about *systems aesthetics*

and *real time systems* were influenced by Ludwig van Bertalanffy's "Systems Theory," in which van Bertalanffy grouped organic entities (natural and man-made) according to how they were organized. "Systems Theory" is related to "Cybernetics" (coined by Norbert Wiener), which is the study of the communication, feedback, and control mechanisms of living systems and machines. Burnham predicted that communications networks would facilitate real time systems which would be able to "gather and process data from environments *in time to effect future events* within those environments." (Burnham 1969: 139)

British artist and educator Roy Ascott advocated for a relationship between art and Cybernetics in the early 1960s, when he became interested in the behavioral sciences, biological processes, and systems of communication and self-regulation. He wanted "spectators" to get involved in his work physically, and to become "decision makers" so that "the work of art occupies a pivotal point between *two sets of behaviour*, the artist's and the spectator's. It is essentially a matrix, the substance *between*." (Ascott 1964: 128, 129) Ascott joined the principles of cybernetics with emerging theories of telecommunications networks; declared the objectives of art to be the processes of artistic creation and reception; and proposed a new paradigm of art that would be distinguished by its emphasis on ambiguity, mutability, feedback and, especially, behavior. (Ascott 1966-67)

Given the emphasis of avant-garde art on process and participation, Cybernetics was able to gain esteem as a theoretical model for articulating the relationships among feedback loops, including practitioners, their 'works', their environments, and their 'audiences'.

"In their writings and works, many artists became increasingly aware of how process connects the superficially independent aspects and objects of life to an interdependent, interconnected network of organic systems, cultural institutions, and human practices. However awkwardly these artists' works anticipated the end of a century that witnessed the advent of massive electronic communication systems like the Internet, their research was vital in visualizing process as a means to align art with the future." (Stiles 1996: 587)

Although the Internet was not widely used until the 1990s, Kaprow, Ascott, and Burnham's theories can easily be applied to *Networked Art*, in which practitioners creatively explore the Internet as both a site of production and transmission. Alternately referred to as Internet Art, Net Art or Networked Performance, *Networked Art* emphasizes interactivity, process, and time and is often characterized by real time, indeterminacy, flux, and emergence.

3. Doing as *Reaction* versus Doing as *Interaction*

Crucial to the discussion of art as *doing* versus art as *object* is the question, "is interaction with a static object different from interaction with a dynamic system?" To-date, *interaction* in Networked Art/New Media has been predominantly about concealing (by the artist/designer) and revealing (by the user). (Haque 2007: 58) *Authentic interaction* is about *co-creating*.

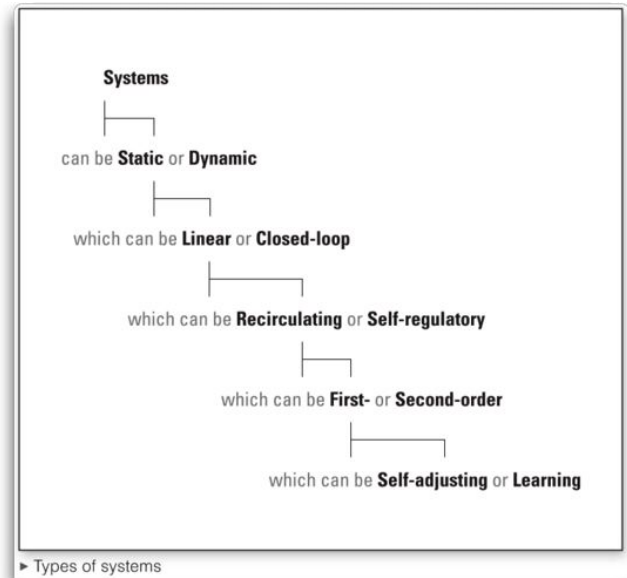


Figure 1: Types of Systems (Dubberly, et al 2009: 71)

Systems can be static/dynamic → which can be linear/closed loop → which can be recirculating/self-regulating → which can be first-/second order → which can be self-adjusting/learning. For instance:

A "first-order" or "reactive" cybernetic system is fixed. The user turns intention into action via an input device (such as a mouse) connected to the physical system. She provides input (by clicking), and it provides output (by opening a window). After she compares her intention (goal) to the system's output, the user determines her next action. Thus, a single feedback loop is established between the user and this self-regulating system. While the ability to click on a hyperlink may be minimally satisfying, "the visual and conceptual stakes of the work still finally reside in the artist's aesthetic choices." (Stiles, Shanken 2009: 86)

"Second-order" or "interactive" cybernetic systems are dynamic. That is, not only can the way that 'input affects output' change; but that which is classed as "input" or "output" can also change. (Dubberly, Pangaro, Haque 2009: 70) These systems can modify their goals based on the effect of user actions. For instance, an interactive systems can consist of a first-order self-regulating system

nested inside a second-order self-regulating system. The second system measures the effect of the first system on the environment and adjusts the first system's goal according to how well its own second-order goal is being met; that is, it *learns*. (Dubberly, Pangaro, Haque 2009: 72) Furthermore, when the output of one learning system becomes input for another, it creates a *conversant* system. Gordon Pask – who was an early proponent and practitioner of Cybernetics – said that such systems had “underspecified goals” which allows them to evolve, much like biological systems.

Put another way by Pask, “in ‘it-referenced’ interaction, the first system pokes or directs the second, while the second does not meaningfully affect the first. In ‘I/you-referenced’ interaction, not only does the second system take in the output of the first, but the first also takes in the output of the second. Each has the choice to respond to the other.” (Dubberly, Pangaro, Haque 2009: 75) Second-order cybernetics is “a framework that accounts for observers, conversations and participants.” (Haque 2007: 54).

“If a designer specifies all parts of a design and its constituent behaviors, it is closed to novelty and can only respond to preconceptions that were explicitly or implicitly built into it. If a designed construct can choose what it senses, either by having ill-defined sensors or by dynamically determining its own perceptual categories, then it moves a step closer to true autonomy which would be required in an authentically interactive system. In an environmental sense, the human component of interaction then becomes crucial because a person involved in determining input/output criteria is productively engaging in conversations with his or her environment.” (Haque 2007: 58)

To summarize, systems that have underspecified goals allow for conversation – human-machine and machine-machine – that, in turn, allows the system to learn and evolve. These systems are authentically interactive, granting participants agency in the process of co-creation. “(T)he insights of second-order cybernetics... demand self-reflexive acknowledgment by the analyst that s/he is inextricably implicated as a participant in the system and cannot stand outside of it.” (Shanken 2009: 6)

4. Agency in *Doing*

“Interactive technologies and agency have become so closely connected that meaning ... signifies as agency...” (Stiles, Shanken 2009: 85) In “Hamlet on the Holodeck,” Janet Murray defined agency as “the satisfying power to take meaningful action and see the results of our decisions and choices.” But she reminds us that “interactors can only

act within the possibilities that have been established by the writing and programming.” (Murray 1998: 24)

The program (code) is a series of instructions that the computer generally performs without interpretation. In “On Code and Codework,” Alan Sondheim makes the distinction between ‘declarative and performative’ codes. Whereas declarative code (speech without response) does what it says, performative code is ‘a set of possible *behavioral responses*’. This performative aspect is the program’s *potentiality* for action; it is less deterministic and allows for unpredictable actions, allowing the system to remain in a state of perpetual becoming. (Cox, 2006)

For Murray, designers have a privileged position *vis-à-vis* their audience (Tanenbaum 2009), thus she supports reactive, not interactive systems. Reactive systems preclude authentic agency. Agency is not merely the freedom to select from a fixed set of choices, but the freedom to interact with a dynamic system that *learns* us and *converses* with us. The second-order cybernetic system allows for mutual and simultaneous activity that enables participants to evolve the system itself and, thus, “to build their own sense of agency.” (Haque 2007: 61)

A word of caution: “there can be a kind of tyranny to interaction.” According to Michel Foucault, among the most malevolent of regimes of power are those that “impose an imperative to participate, particularly if the imperative is to... ‘authentically’ participate... You are under orders to be yourself – for the system.” (Massumi 2007: 77)

CONCLUSION

To-date, many *Networked Art* works have been erroneously credited with being *interactive*. Instead, many of these works are built on reactive, single feedback loop systems that do not grant their audiences the *participatory* role they claim to allow. For *authentic* interaction to take place, creative practitioners must create second-order cybernetic systems in which participants have agency to co-create the system, so that the system is in a state of perpetual conversation. For “(i)t is in the nature of conversation, indeed, it is (at a certain level) its purpose, that the unexpected happens and interrupts the normal and conventional flow.” (Glanville 1996) For *Networked Art* to further the goals of the avant-garde – flux, indeterminacy, and change – a real time, conversational, systems strategy ought to be adopted and proliferated.

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