

# The Technical as Aesthetic: Technology, Art-making, Interpretation

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## Abstract

In this paper, I seek to (re-)align technological thinking with progressive thought in music by emphasizing a *dialectical* understanding of technology over and above a deterministic understanding. Toward this end, I first discuss some of the ways in which standard approaches to technology enforce the demotion of technical objects in their equation as use-function, and disclose the cognitively and epistemologically reductive task environmental frameworks such approaches promote. These include the ubiquitous computer *interface*, and the “user-friendly” ideology it exemplifies. A dialectical understanding of technology, by contrast, proposes a technological that reveals itself in the particularity of thought at the very moment at which it is least identical to its integrative concept. Such a technology favors the segregative particularity of human involvement over the heuristics of a generalizable (and thus “functional”) productivity—an approach frequently taken by composers (and other artists) in their effort to (re-)constitute material and working process.

## Introduction

In both our day-to-day commerce and in scientific discourse, technology is most commonly understood in its *instrumental* dimension—its effectiveness is measured primarily in its successfully realized *end*, over and above its means. By this understanding, technology is defined either by the tools of productive activity, or by the systematic thinking which gives those tools their social identity and use-function. Both definitions emphasize technology’s pragmatist foundational agenda. From such a nominal interpretation of the technological arises the conflation of technology with technical things—the notion that the technological can be revealed solely within the technical realm.

Heidegger cautions that “[s]o long as we represent technology as an instrument, we remain transfixed in the will to master it” (Heidegger 1977, 314). As Horkheimer and Adorno strenuously argued over 50 years ago, this cultural will toward mastery brings about the coercive character of modern life (Horkheimer 1972). It is this coercive character—and the integrative thematic by which it is ideologically projected—that progressive art (e.g. the *avant-garde*) negates (Burger 1984; Adorno 1994). Early electronic and computer music resonated this sentiment by preserving and in fact sublimating the technological problematic from which it sprang. Positivism, however, opposes negative capacity by asserting technology’s integrative agenda and exerting its imperative of “ease-of-use.” Recent so-called “technological art” reflects this agenda when it asserts its mastery over an otherwise problematic technological and applies ease-of-use heuristics to both the technique and its result. It thus reaffirms the will to mastery which characterizes the dominant relation of society over an instrumentally interpreted technology. A return to the classical binary dualities—once thought vanquished by progressive

art and science—characterizes this alignment of art with society. Unity over differentiation; facility over problematic; affirmation over negation—these characterize the ideology of a technological art in opposition to progressive thought.

In this paper, I seek to (re-)align technological thinking with progressive thought by emphasizing a *dialectical* understanding of technology. Toward this end, I first discuss some of the ways in which standard approaches to technology enforce the demotion of technical objects in their equation as use-function, and disclose the cognitively and epistemologically reductive task environmental frameworks such approaches promote. That which constitutes the technological is expelled from the very technical things in which it is embedded—its traces are wiped out by its *veridical* success. A dialectical understanding of technology, by contrast, proposes a technological that reveals itself in the particularity of thought at the very moment at which it is least identical to its integrative concept. Such a technology favors the segregative particularity of human involvement over the heuristics of a generalizable (and thus “functional”) productivity.

Given such an understanding of technology, art embraces the technological when it’s aims collide with the generalizing tendency inherent in technology’s instrumental interpretation—when it’s practice most explicitly mediates the very means, both historical and technical, of its own productive capabilities. In becoming technological, art both contains and negates the history of use-functions, discourses, tool-making, and institutional (historical) know-how by which it is integrated with its historical character. Such a technological art penetrates technology *as means*. In this way, its activity understands the technological as aesthetic, and vice-versa.

## **Technological Determinism and the Colonization of Technique**

Standard interpretive approaches to technology view technology as having “an autonomous functional logic that can be explained without reference to society” (Feenberg 1995, 7). In computer science curricula, for instance, we study things like algorithms and data structures, under the more general assumption of the autonomy of their development. Feenberg, along with other critics, calls this approach “technological determinism.” Technological determinism rests on the bipartite premise (1) that technology progresses from lower to higher levels of achievement (i.e. it *improves* over time), and (2) that technological development follows a single unified sequence of necessary stages. Technological determinism drives an *immanent* interpretation of history “by projecting the abstract technical logic of the finished object back into the past as a cause of development” (Feenberg 1995, 7). Under the assumption of technological determinism, blatantly anti-humanistic practices—ranging from exclusion of popular participation in the framing of technological decisions to educational systems which teach students that technology is impervious to human desire—are justified, when and if they are even acknowledged. Humans are forced to accept the immutability of technical things and, lacking an epistemological framework for differentiating technical things from technology at large, conclude that the technological constitutes itself solely in those things, while characterizing itself in terms of their immutability.

Another premise of technological determinism is its reification of ends. Technique is neutralized in the use defined for the resulting object, its differentiation of activity re-integrated in the socially mediated interpretation of that object. Regarding the finished object, Fredric

Jameson points out that, in a traditional pre-capitalist era, “the value of the activity is immanent to it, and qualitatively distinct from other ends or values articulated in other forms of human work or play” (Jameson 1990, 10). This meant that the various kinds of work were utterly incomparable, even at their most deeply sedimented philosophical description.

With capitalism came the annulment of differentiation in labor. Jameson writes:

It is only with the universal commodification of labor power, which Marx’s *Capital* designates as the fundamental precondition of capitalism, that all forms of human labor can be separated out from their unique qualitative differentiation as distinct types of activity (mining as opposed to farming, opera composition as distinct from textile manufacture), and all universally ranged under the common denominator of the quantitative, that is, under the universal exchange value of money” (Jameson 1990, 10).

The unique qualities that distinguish various means are, as Jameson puts it, “suspended by the market system, leaving all the activities free to be ruthlessly reorganized” in terms that are defined according to market imperatives (Jameson 1990, 11). All productive activity is predicated along performative principles: the factory setting became the workplace prototype irregardless of the particularity of the ends to which they were committed. Ends proliferate while means are subordinated.

In its transformation into mere commodity—and its subsequent loss of intrinsic differentiation—the thing becomes the agency for its own consumption. In its loss of intrinsic value, the thing’s value—its *raison d’etre*—is obtained solely along the terms of its intended use. Its fetishization as commodity attenuates the particularity of its development—it wipes out the traces of individual thought and activity and thus obliterates the trace of potential human volitional involvement in its development.

Such foreclosure of the particular in favor of the general characterizes the performative imperative of the computer *interface*. The interface has been portrayed as a “meta-form” that guides us through an otherwise indeterminate “information-space,” thus sparing us “the risk of losing ourselves in the surplus information” (Johnson 1996, 38). “Ease-of-use” has elbowed out representational flexibility as the primary criterion for the design of human/computer interaction. Through a combination of “direct manipulation” (Hutchins 1986) and “cognitive engineering” design principles (Norman 1986), the interface replaces *computation* with *use*, transforming the human from “programmer” to “user.” The purpose of the interface is to bridge the gulfs which separate “user” from “system.” This is done by writing additional software to translate the I/O properties of the system into normative representations that the user can almost immediately understand. The interface thus frees the user’s attention for domain-related activities—s/he is no longer responsible for the behavior of the computer. Thus, the computer becomes a piece of *equipment*, succumbing to the appropriated use-function defined by the interface (Heidegger 1962).

As equipment, the computer resonates wider cultural use-practices. The ease-of-use of a program like Word stems not from an innate ability of the human to apprehend its particular language of interaction. Rather it stems from a history of culturally redundant experiences with which the interface is designed to cognitively resonate. The human becomes a “user” in assuming the proper forms of behavior and expectation appropriate to that language (Bourdieu 1993). The constraints built into the interface determine the cognitive, behavioral, and epistemological constraints available to its user. Under such constraints, human activity

becomes habitual, *circumspective*—the human becomes almost as automated as the thing s/he is using (Dreyfus 1993, 67).

## From Interface to Subject-Object Dialectic

Once an activity becomes habitual, the only way it can be interrupted is if something “breaks down.” When this occurs—the software fails, or the computer crashes—one is no longer a mere “user:” one is quite suddenly thrust to the fore into an interpretive context (Dreyfus 1993, 72). Things suddenly become “unfamiliar”—they become foreign to that with which one normally comports oneself circumspectively. In this aspect, the properties and structures of the environment—previously subsumed under the imperative of their comportment *as equipment*—suddenly become apparent, available for inspection and interpretive involvement.

According to Kant, terror of the unfamiliar is related to the *sublime* (Kant 1987, 99). While most often merely disruptive (or terrifying), breakdowns also occasion the appearance of a subjectivity correlated to the unfolding of a material no longer constrained by an overriding concept. When in breakdown, material becomes, even if for a brief moment, indeterminate. As indeterminate, it gets its content from a similarly indeterminate unfolding of thought—it is no longer obtained strictly from the static historical/cultural frame with respect to which it has come to be known. In such an encounter, *technique* is no longer bound solely to an end result, subsumed and encapsulated within habituated practice which gives little notice to it. In breakdown, technique itself becomes the very object of investigation, the aim of which includes the very process of investigation. Under such circumstances, the end result is contingent upon the particularity of that investigation, no longer wholly dependent upon the socially mediated concept under which its productive agency is otherwise constrained.

In such an interaction, it is not just the material that is altered—so too is the thought that tries to comprehend it. Thought has an empirical basis—it unfolds within an environment delineated by the unfolding of a material (Adorno 1993, 21). However, thought is not bound to the material itself, as though the latter existed independent of the former. Thought’s own unfolding is engendered in the *activity* through which it brings about the unfolding of a material, not in the material itself (Adorno 1993, 22). As artist Robert Morris notes,

Objects project possibilities for actions as much as they themselves project that they were acted upon; the former allows for subtle identifications and orientations; the latter if emphasized is a recovery of the time that welds together ends and means (Morris 1970, 66).

Dialectically, such an interaction projects a subject

that is mutable and emergent, rather than fixed and transcendent. As emergent, a subject arises in the moment at which something unfamiliar, or foreign, appears, and, in its labor over the comprehension and synthesis of that something, projects itself toward it (Hamman 1999, 93).

Subject and object (thought and material) become mutually determinative—the tyranny of the socially mediated *concept*, to which subject and object were once rendered identical by social

practice and through the pragmatically constituted *interface*, is overthrown in a dialectical sublimation of process.

## Technique

By such a transformation, the ‘interface,’ as static referential frame, is subordinated—the focus of interaction shifts from a concern for the heuristics of the result, toward investigation of the means of it’s own production. The end result reflects a development both of the material and of the thought by which it is conceived and shaped. Such a shift in emphasis penetrates the technological with the aesthetic—a joining of *techne* and *poiesis*. This is precisely what Heidegger diagnosed for an instrumentally overdetermined technology:

Because the essence of technology is nothing technological, essential reflection upon technology and decisive confrontation with it must happen in a realm that is, on the one hand, akin to the essence of technology and, on the other, fundamentally different from it. . . . Such a realm is art (Heidegger 1977 p 317).

Just as the essence of technology may be found in the realm of art, such a realm is not that which defines itself purely in terms merely of its art objects. Rather, it is to be observed *in the activity of making* (Shusterman 2000, 42; Becker 1982). The capability—formal, social, theoretical—of the artwork is directly traceable to the particularity of its means, while the unfolding means is itself conditioned to that, as-yet imagined, capability.

It is in this sense that *means* and *ends* mutually constitute one another. Since the 1950’s, progressive art has configured itself around this means/ends dialectic. As such, its primary objective is the *engineering of breakdowns*, both at the esthetic (observing art) and at the technical (making art) levels. In so configuring itself, art gives primacy to process, including in its objects the very means toward their ends. As Robert Morris again writes,

I believe there are ‘forms’ to be found within the activity of making as much as within the end products. These are forms of behavior aimed at testing the limits and possibilities involved in that particular interaction between one’s actions and the materials of the environment (Morris 1970, 62).

In its interest in and concern for the forms of the activity of making, art-making differentiates itself from other forms of culturally resonant activity. This does not posit an art-making unconcerned with its artifact—in fact, the artifact is crucial to the dialectical nature of the activity. But rather than something that *encapsulates* its technique—quietly hiding the technique—the artifact is that which *arises within* its technique.

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Consider for instance Jackson Pollock’s method of painting. Pollock made a series of paintings in which he would lay the canvas on the ground and apply paint by dripping, pouring, and flinging it across its surface. Such technique brought to bare entirely new principles for paint application. For one thing, the painter now had to take into account the effects of gravity

on paints of different viscosities—thick paint falls differently than does thin paint, for example. In addition, the painter employed movement of the body in an entirely different manner than is possible with easel or wall painting. In developing this technique, Pollock effectively restructured the domain of interaction available to him and in doing so, brought about the re-appearance of otherwise standard materials and of the working process. Such *idiosyncratic* technique occasioned a different interpretation of materiality, the very physicality of which constituted the gestural “aura” of the resulting paintings.

Throughout the last 50 years, composers have been similarly engaged. The so-called “formalist” approach of composers, for instance, is profoundly based in the empirical, not the theoretical—it is occasioned by a desire to fashion a conceptualization of materials and the possibility for their combination and interaction rather than a desire to explain music in any large sense. Even Milton Babbitt’s holistic twelve-tone systems are intended primarily as empirical means—their invention was understood “to be part of the creative resource of composition, rather than its invariant context” (Boretz et. al. 1972, ix). Similarly, in his appropriation of so-called “chance” operations into music composition, John Cage sought to *re-present* the possibility of sonic materials and their combination—to structure a particular materials/process interaction. For instance, his use of charts in works of the early 1950’s—as in *Music of Changes*—insured “combinations [of sonic elements] that Cage would never have considered himself” (Pritchett 1993, 79). Compositional procedure focused not so much on the production of particular musical artifacts (musical works, etc.), as on the process by which such a production might itself be composed. Such a notion of compositional activity, while not bound exclusively to the imperative of the particular musical artifact, is nevertheless informed by it. The output is not simply random, freely interpretable “raw data”—rather, it constitutes a notion of a material that is prefigured in the design of the system through which it is realized.

## Artificial Intelligence

The dialectical approach to technology characterizes one of the most important empirical insights generated by early electroacoustic music: that the relationship between the particularity of a technology and the means by which musical structures might be conceived and realized were understood to be mutually determinative (Eimert 1959, 3; Di Scipio 1995). The radical approach to musical form and material that emerged from the electroacoustic music studio could only have occurred within a studio interpreted dialectically, wherein technique is mediated by compositional thought, and vice versa. The attitude reflected an interpretive stance regarding the possibilities of electroacoustic music that was not present in earlier electronic technologies like the Theremin (which still preserved instrumental music notional views). Interpreted dialectically, technical difficulties encountered in the studio were not something to be “overcome” in order to insure preservation of older musical traditions. Rather, those difficulties were themselves understood musically inasmuch as they both framed, and were framed by, musical thought. Musical thought was no longer bound solely to a *transcendental* musical object—the musical object *per se* arose as a consequence of the particularity of the investigations and experiments under which acoustical material, and the techniques for its production, were produced.

The computer extended this capacity since it gave the composer the chance to explicitly design her/his compositional processes through programming (Laske 1991, 236). In its tendency toward utter abstraction, the computer empowered the composer to compose the very means for

composing music and thus investigate, in an explicit way, the relationship between stipulated criteria and the results of their computation. This meant not only that the composer could control, in great detail, all musically relevant aspects of potential musical artifacts—though this was significant for many composers—but, more significantly, it also meant that the composer could construct the very systems by which music, as-yet unimagined, might be imagined. In such a way, the computer allowed the composer to extend so-called “pre-compositional” activity into the very design of compositional procedure itself—to empower, in other words, *rule*-based rather than *example*-based models of compositional design (Laske 1991, 238).

In enabling not merely data modeling, but process modeling as well, the computer allows the composer to think *systematically*. Such an approach to systematic composition understands both the system and the musical artifacts that result from its use as explicitly *artificial* (Laske 1992; Simon 1969). As artificial, systems demand explicitly interpretive activity and, as such, empower a subjectivity that is explicitly *volitional*. As Herbert Brün writes:

For anything to be of relevance to something, to be of significance to someone, a system has to be created; an artificially limited and conditioned system has to be imagined and then defined. *Only artificial systems will clearly show that they have been elected by choice . . . .* (Brün 1969, 119, my emphasis).

Whether the system is “limited” or “conditioned” is not the issue—all systems are, by their construction, both limited and conditioned. The issue is whether the limitations and conditions are the traces of individual human choice or of cultural appropriation.

## From Technical To Technological

Artificial systems index human involvement—to understand them is to comprehend the interpretive activity with respect to which they structure the human productive impulse. Their admittance into human activity relies upon the utter interpretability of technology. For the composer, technology, understood as an interpretive framework, becomes a means for designing models according to which musical materials and formal criteria might be imagined and realized. Approached in this manner, technical devices—from equipment in the studio to computer software for sound synthesis—occur within the context of a discursive frame. The discursive frame is as much the subject of compositional investigation as are the materials and formal criteria which emanate from that frame. Composition becomes a form of “system design” and musical artifacts become *traces* of that design (Brün 1969, p. 119). The musical work, *per se*, includes the acoustical trace (the acoustical “artifact”) plus the technical means by which that artifact is imagined, realized, and conceived.

Such a notion of the musical work negates the cultural imperative by which musical works—and more generally artworks—are understood as technically autonomous artifacts whose function is constituted by their utter functionality (bourgeois enjoyment, affirmation of church, state, or corporate organization, etc.). As technological forms—and therefore interpretive—musical works constitute knowledge systems: they are, as Adorno argued for artworks more generally, *cognitive* (Adorno 1997). A musical work can no longer be accounted for purely through examination of the acoustical experience it engenders or the formal structure it may exhibit. As technological, the work constitutes both the result and the technological forms by

which the result was realized. These include the particular technical tools plus the attitude of the subject under whose unfolding those tools were taken up and applied. To equate music solely with the results of its productive activity is to disembodify the result from its technique—it is to fetishize the musical work, converting it from a catalyst for experience into a commodity to be traded within an economy, whether financial or ideological.

## Conclusion

As a context for dialectical mediation, and in transgressing its allegiance to the positivistic frame by which it is commonly defined, technology occasions the reintroduction of the subject. The tools and concepts that define technology's realization are no longer disembodied from the particular questions and inquiries in whose service they are brought to bare. Rather, the very structure and meaning which technical objects are accorded arise as much as a consequence of those very particular questions and inquiries as they do from the transcendental concept by which the history of those objects is reified. The subject, so-introduced, is not the ethereal concept-less subject imputed by positivism's rebellion against idealism. Rather, the subject is immanent in the particular manner in which technical objects are interpreted and implemented.

In re-introducing the subject, technological art enacts a form of *subversive rationalism*—a form of resistance against the totalizing agency with which technology is reified, socially and politically. Such an approach to technology “challenge[s] the horizon of rationality under which technology is currently designed” (Feenberg 1995, 18), dismissing the deterministic framework typically accorded it. Art, just like science, strives for “mastery over its material” (Jarvis 1998, 106). However, art, in so striving, includes in its domination a “critique” of that domination—a negation of the techniques by which that domination is historically propagated (Jarvis 1998, 106). Art, in its exertion over *technique*, is already technological. Progressive art of the last 50 years amplifies art's exertion over technique by understanding the technological as interpretive frame and in approaching technique as a dialectical activity. Such an interpretive stance regarding technology dismisses the purely instrumental interpretation that characterizes standard approaches to technology.

Many composers have, over the last 40 years, continued to challenge the instrumental view of technology promoted by its standard interpretations and applications. Composers from the most diverse perspectives—from Gottfried-Michael Koenig to Iannis Xenakis to Thomas DeLio to Agostino Di Scipio—continue to explore ways in which technology—both as interpretive framework and as social fact—effect and determine cognitive and epistemological life. They understand technology not as mere means toward an end but as a context for a concern with means itself. For these composers, technology *preserves* the problematic of compositional process rather than attenuating it, while the technical thing is transformed from an object for the social mediation of cognitive and epistemological activity to an object through which humans explicitly and experimentally participate directly in the shaping of that activity.

*To Mark Enslin and Susan Parenti.*

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