Towards a critical theory of (music) technology.
Computer music and *subversive* rationalization

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Abstract

Most computer music today seems to validate the apparently reasonable assumption that technology is a decontextualized, autonomous domain of its own, evolving through refinement stages in an attempt to solve problems in ever more efficient and successful ways. A serious approach on man's technically mediated action to the world - i.e. a *logos* of *techne,* existing since Plato's time - would disregard that as a form of ideology. Endeavors in computer music often seem to contribute to such an ideological view, in contrast with their own cultural potential. A significant element in approaching the technologies of art, in general, and of music, in particular, lies precisely in a critical perspective on issues of technology, its cultural and political repercussions.

Introduction

In the 50ies, the Italian music-theorist Luigi Rognoni observed that "electronic" music was born as a special domain where musicians ultimately can focus on how they make music, on the actions by which they bring about their artifacts [1]. Accordingly, electroacoustic and computer music can be regarded as constituting a techno-logy of music, a discoursive domain concerning the musical *techne*. As today computer technology covers most aspects of life, the *logos* of contemporary musical *techne* may become a significant, albeit particular, contribution to the *logos* of digital media in general, with their repercussions on the social and political process. These notions are to be linked, in my view, with an understanding of the hermeneutic (cognitive and social) dimesions of technology, especially as approached in the *critical theory of technology* [2] and in novel views on design [3].

The work of artists exploiting computer media potentially discloses and clarifies aspects proper to the technological process: they make clear that technical means are as a social variable depending on the people using technologies *in a different way than predicted by designers*, to at least the same extent as depending on design styles and the consolidated theories inscribed into the technical tools (not to mention manufacturers' interests, of course, which usually represent as a brake for technical change). Computer artists have a privileged position: they can develop a critical understanding of the processes going on in today's overly technologized life. They can be "specific intellectuals" (Focault) contributing to society by revealing personal, idiosincratic, ways of re-arranging and re-interpreting the tools and methods of our thoroughly mediated existence (in the Western world, at least).

The domain of musical *techne* and *poiesis*

Does that mean a sort of anarchistic attitude towards technology? I don't think so. Rather, it is a question of understanding the process of art itself as one that always involves a *critical attitude* towards the tools and means by which artist operate in this or that medium. Human endeavors called creative - man's *poiesis*, the bringing forth of objects which would not have come to existence without composition, without art, without desire - entail a hidden orientation towards discarding the technical code inscribed into available tools. In short: *art is made by inventing the techniques of its making*, which is to say by questioning established, inherited techniques and methods. Artifacts are as traces of poiesis, tangible products testifying at invented ways of acting in a medium (i.e. in the world). Artifacts are objects *made by art* - thus *not* art in itself. Art making features less a finalistic, teleological component, which dictates how something actual can be shaped out of ideals present in mind, than an indeterministic component, which raises the possibility of doing actions that were never done before, whose final artifacts are traces of an explorative process. In this light, the work of artists is always *experimental*: it renders experiences possible which come from the free, arbitrary choice of doing and making by possible, but never explored as yet, procedures, actions, techniques. (Of Robert

Rauschenberg, Cage said that he mastered many painting techniques but had never used them, using rather techniques *unknown* to him [4].)

Many historical cases in the evolution of musical media (e.g. early electronic and computer music research and earlier recording methods, such as Edison's phonograph) provide examples of *subversive rationalization*: often people use tools and consolidated technical methods in a *degenerated* way, disclosing possibilities unforeseen by designers. A detailed discussion of this important issue would hardly skip over the cognitive and aesthetic dimensions of music technology, raising questions of interest also to a renewed approach on computer music system design. In the following I limit to a few general observations (see more thorough discussion in [5]).

Technology decontextualized

The widespread notion that technology can help us solve practical problems and yet have no influence on our being implies that technology is a decontextualized, autonomous domain. It depicts technology as independent of social and cultural processes, and still having a formidable impact on them. On this view, society is in part dependent on extra-social factors. Also, the incessant development of technology is shown as unavoidable, evolving through refinement stages that only obey technical necessity and advance from less to more powerful technical solutions. These two theses (technology as *autonomous* and *progressive*) are characteristics of *technological determinism* (with terms of [2]).

Technological determinism tends to validate the humanistic tenet that tools are *neutral* to the goals they serve. Accordingly, technology's undesirable consequences (e.g. pollution, including *muzak* pollution) would be only due to irresponsible usage. As if the knowledge embodied in the design were value-free.

The theses of autonomy and that of neutrality have a highly valued philosophical pedigree. In modern times, Martin Heidegger, for example, has held the view that cybernetics (alias computer science, alias artificial intelligence) is the latest manifestation of Western rationalism (metaphysics) [6, 7, 8]. Although Heidegger's questions concerning technology open to potentially fertile positions (see, for example, [3]), yet the autonomy and neutrality theses in the end support technocratic positions (both *technophobia* and *technofilia* imply determinism). Technocrats and humanists both rely - with contrasting goals in mind - on a decontextualizing account of technology. That account is so common and uncritically accepted today that in fact it has become, at least in the West, a pervasive ideology.

Music and technological determinism

It is an instance of technological determinism to believe that the technical environment within which an artist works is not her/his affair at all. Accordingly, a composer would regard computers as just wonderful machines, powerful tools enabling her/him to surpass obstacles that hinder her/him from a fully satisfying realization of musical ideas - while playing no particular role in the bearing of those ideas. Here the computer is a means of power, the power to actualize musical imagination. Efforts in composition-theory (the only area of contemporary musicology which seems to face issues of technology in a serious way) show that there is more to the relation between compositions and its tools. Most music-theoretical approaches to, and historic-aesthetic accounts of, contemporary endeavors in musical research and composition, rely on a weak and ideological treatment of technology. They tacitly accept (and hence unknowinglu support) the broader context of technological determinism inasmuch as they neglect the hermeneutic dimensions in the techne of music. They fail to provide a critique which might foreground relevant aspects of this techne, and thus fail to show the non-obviousness of the rationalistic orientation embodied by most of current music technologies.

Such state of affairs is mirrored today by the policy carried out in computer music institutions. Such institutions (especially in Europe) invite composers with a solid background in instrumental and vocal music, and allow them a cursory overview of the available technical resources. Composers are expected to put forth musical ideas that qualified technicians and programmers make audible for them. Computer technology is perceived as a web of powerful tools in the service of instrumental music writing, an addition to the existing palette of compositional methods (and quite often just an addition to the palette of orchestral timbres). A technology of music of this kind is simply the reified foreknowledge - a pool of readily available resources (*Bestand*) - by which artists gain control over the eventual and unseen (unheard), replacing it with the actual and the foreseen (foreheard). Elsewhere I've shown that such an attitude is consistent with the view put forth by Heidegger in the 40ies and 50ies: technologies are supposed to enhance our performances (basically a matter of *problem-solving*) still leaving our understanding (e.g. the notion itself of *composing*) untouched.

Indeterminism and *subversive* rationalization

An alternative holds that we cannot consider technology outside cultural and social contexts. We can only speak of *specific* technologies. Any particular technology supports a specific hegemony [1]

[1] I do not only mean *political* hegemony, but the consolidation of a specific piece of knowledge or theory and the related cultural

as it offers material support to the cultural horizon to which it has been preformed. Technical tools and processes are value-laden. For a composer, therefore, dealing with the technology of her/his art is as an opportunity to challenge established and uncritically accepted practices and theories, the known modalities of personal or shared modalities of music making. In principle, it can foster a renewal of the aesthetic reaches of her/his artifacts. But that usually doesn't come without a questioning the techne of music: *what* I do may not justify *how* I do.

Such an approach can be seen as an instance of subversive rationalization in that it requires "technological advances that can be made only in opposition to the dominant hegemony [...], an alternative to [...] the ongoing celebration of technocracy triumphant" [9]. It represents a reasonable alternative to both conservative, technophobic views and technocratic views as well. In a sense, the social meaning of cultural phenomena like electronic art or computer music may be in a potential to propagate and support critical *and* constructive attitudes towards the technology where our being takes place. This potential becomes actuality whenever an artist *interprets* technology in her/his own peculiar way, possibly independent of uncritically accepted *vulgata*. That's more likely to happen with a direct involvement in the "merely" technical details than with a step back from them.

Today worldwide network communication media are well-known manifestations of technological *indeterminism*: their meaning and social scope were unforeseen at the outset and have been largely determined by every person who freely accessed it and worked with it - before industry (and then politicians) realized its potential. Similarly, in the 40ies and 50ies, *elektronische Musik* and *musique concrète* were born by a re-interpretation of technical pieces of gear which were solely meant for scientific measurements and control. Those tools were tools of reproduction and storage, but some crazy composer or music amateur bent them to methods of creative production contrasting with their original design code.

Technological indeterminism means that man's techne does not develop on an autonomous, extra-social level: it is dependent on the active participation of people - artists among them - who confront with and challenge the hegemonic code and the knowledge embodied in technical tools. (An old Marxist thesis re-surfaces here, according to which *technology is a socially dependent variable*.) Although obscured by the uncritically accepted horizon of rationalistic standpoints, the theory of technological indeterminism, with its emphasis on the participation of people in the shaping of design standards, is central to current efforts in critical theory, and is gaining attention even among philosophers of science and other critical approaches on the tradition of Western rationalism.

In my view technological indeterminism can support more accurate an understanding of electronic art and music than typically deterministic accounts can. It unconceals the possibility that, while apparently marginal and elitistic, still the work of computer artists *can* have important social repercussions.

Composing as modelling experience

A common view reflecting a deterministic mindset, is that artistic ideas are independent of any specific technological substratum. Among other things, this view would mean that although computer technology has ultimately become an environment that shapes our own way of being, it would not have particular influence in the domain of art (except, of course, an *instrumental* influence, a matter of efficiency). Hence not only technology would be independent of society, as art itself would be autonomous vis-à-vis the (technically mediated) environment within which it happens. As it appears, then, the autonomy thesis is transferred from technology to art.

I think this involves a narrow focus on what it means to compose. An activity of design meant to model experience, composing entails (conscious or unconscious) decisions about one's own social and cultural environment. It is well-known that *musical form* and *musical material* are themselves not at all immutable and a-historical definitions. They change over time, according to a plurality of cultural factors [10]. Decisions about materials and form reflect social and aesthetic stances, either shared or personal, immersed as they are in a body of knowledge concerning how one can act upon materials and form. In short: they imply a techno-logy, an understanding of the particular musical techne. The technical strategies by which a composer shapes materials and form reflect meaningful aspects of her/his worldview. They embody a way of understanding and a way of modelling experience.

The analysis of compositional tools and actions (music analysis based on composition-theory) has the effect of shattering the illusion that an artist's technical environment is neutral to her/his goals, and of revealing the many links between technical means (their cognitive potential) and musical concepts (their aesthetic potential, the worldview they put forth). The *substantive* thesis here applies that *an agent is its own means of action*. The agent and her/his techne are as two poles of the dialectical process of poiesis. While this is the case with any technically mediated human endeavor whatsoever, composition is a special domain where man deliberately confronts the technical (cognitive) conditions of her/his agency.

For a composer the making and using of techniques or tools unveils the immaterial, metaphysical aspects of musical ideas or concepts, and challenges her/his knowledge and decisions concerning materials and forms. It is no metaphor to say that an artist's techne has a *subversive* potential: it is by dealing with her/his

implications. For example, computer programs that enable to write music in common music notation reflect the commonly accepted opinion that *composing* is *writing* - a questionable view, for some.

own possibilities of actions that one ultimately unhinges established strategies of modelling experience. Composing involves a dynamical relation between the conceptual (knowledge acquired and formalized) and the perceptual (knowledge being acquired) [11]. The cognitive relevance of technology means that the composer's techne is the locus where that dynamics is worked out time after time. If the agent is its own means of action, then a change in the means marks a change in the agent and viceversa.

An ethics of technological composing?

The claim that there is little reason for an artist to keep a critical, dynamical appraoch to the technical environment in which her/his art happens, is ethically suspect. "If we *choose* to leave something untouched by technology, is that not a subtler kind of technical determination?" [2]. If we choose to see art as something that abstracts (and let we abstract ourselves) from today overly technologized and thus impoverished life, are we not using art as a kind of supertechnology? Is that not an *instrumental* decision? The logics of technological determinism reflects into a thoroughly technologized understanding of the artistic experience.

In contrast, a more critical perspective on the techne of music is for a composer as a reasonable chance to participate in the debates concerning the potential for culture and democratization in computer technology and digital media. Not a minor aspect of their work, computer music composers can disclose *margins of maneuver* left to (but usually concealed from) most people in today's technologically mediated world - a significant, *factual* contribution to society. That could pave the way for the demarginalization of musical research in the socio-cultural context, certainly in a less ideological way than programmatic but technologically naÏve positions could.

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