NOTATION AS TEMPORAL INSTRUMENT

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ABSTRACT

In this paper the author proposes a descriptive musicological framework built on the notion of notation as temporal instrument in today's context of electronic music. The principal goal is to discuss a research categorization of musical notation that consider the performative character of musical writing in electronic music performance. In the intentions of the author, this framework could resume the multiple enhancement of the temporal dimension of notation implied by the new means of performance in electronic music.

1. INTRODUCTION

Claude Cadoz [1], Anne Veitl [2] and Chris Nash [3] define a notational system from the point of view of its usability and performability. In particular, for Veilt, *performability* and *causality* are two of the main characters of a writing system ("*système d'écriture*"), among *materiability*, *visibility*, *readability*, and *systemic character*. For Veilt programs for synthesis and sampling are at the same time instruments, in the sense of Mathews, and tablature-like scores. Thus, music notation becomes a concrete instrument for performance, exploiting its performative character. While traditionally music notation is used to write past events (with the principal objective of documentation, analysis and transmission), or future events (new compositions written for future performances), today, programming is an act, applied to perform electronic music in the present, in the studio or on the scene.

These considerations are related to the philosophical debate of notation of Goodman's theory of notation [4], *event theory* [5, 6, 7] and *embodied cognition* [8, 9]. However, the author is aware of the subtle difficulties that lies in these theories and ask the reader to consider them more as a theoretical reference than a philosophical discussion.

2. TEMPORAL INSTRUMENT: DELAYING AND PROJECTING MUSICAL ACTS

As claimed by Christopher Small, composers "provide materials for the performance" [9]. This statement denotes one dimension of notation, that is the prescription of actions oriented towards the creation of events on the scene. Thus notation could be seen, in part, as characterized by *projections*. This musical act could be seen at the light of Nelson Goodman's concept of *projectibility*:

> To learn and use any language it to resolve problems of projection. On the basis of sample inscriptions of a character we must decide whether other marks, as they appear, belong to that character; and on the basis of sample compliants of a character, we must decide whether other objects comply. Notational and discursive languages are alike in this respect. [4]

or Andrew Sorensen's notion of *act of programming* [13]. Today, if we accept, as Veitl suggest, that programs are scores, scores create events in performances becoming a particular kind of instrument, that could be played in order to create music in live performances. This hypothesis, near to the causal paradigm proposed by Veitl, incorporates two other theories. The first one is the one of "sound event" explained by O'Callaghan as following:

> Sounds stand in causal relations to the activities of objects and events that are sound sources, and they fulfill the causal requirement on any account of their veridical perception. Sounds thus occupy distinctive causal roles. Sounds are particular events of a certain kind. They are events in which a moving object disturbs a surrounding medium and sets it moving. The strikings and crashings are not the sounds, but are the causes of sounds. The waves in the medium are not the sounds themselves, but are the effects of sounds. Sounds so conceived possess the properties we hear sounds as possessing: pitch, timbre, loudness, duration, and spatial location. [7]

The second one is the physiological and perceptual implications of electronic music. Traditionally, the body is the trigger that gives energy, and sense, to sound events towards physical effort. Nowadays, in electronic music performance, this effort is transferred to the computer (and its interfaces). However, even if it is perceptually

weakened, in this evolution the causal aspect of notation rests fundamental. In fact notation projects movements in time, prescribing causalities in the future and synthesizing possible causalities of the past: it embodies, in the case of human or digital performer, information for the performance. Notation, used as compositional instrument, is characterized by projections of movements in virtue of the absence of the physicality of the sound and of the performer. But, as traditionally, even in electronic music the composer projects sound objects in time in an inter-subjective dimension. Thus the score includes, implicitly, the body of the performer (human or digital) in a unique musical act that starts from the composition of the score and ends in the public performance of the piece. Performers and composers are entrenched in the same form of projection characterized by different degrees of distance from the gestural and sonic output. The composer uses the score as an instrument, as a temporal and physical interface of abstract interaction in time and space with the body of the performer which aims for it to create the sound event: *scores are extensions of the body of the composer in the body of the performer via the projection of the instrument represented by the score* [10]. That creates a singular temporal dimension based on the absence and presence of the instrument: the composer constructs absences and the performer reconstructs the projected presences. In recent electronic music's performances the composer, which write the score on the scene programming the music, correspond with the performer. It seams to the author of this paper that writing become a performative instrument.

As instruments are spatially related with sound and connected directly to the body of the performer, notation is just behind the performative gesture, temporally related with the gestural causality of sound. In electronic music programming is, for instance in *live coding*, a performative act. Consequently emerges a new dimension of notation as instrument (in the sense that it relates sound to gesture) that is not only instrument of the past (memory) and future (projection) but also of the present (performance). This development, in the idea of the author, is due to the new dimension of prescription that electronic music means imply. These forms of prescription, in notation, express, anyway, two forms of causality realized traditionally for the human body and today for the electronic body, the loudspeaker.

3. TWO DIMENSIONS OF PRESCRIPTION: *ERGOGRAPHIC* AND *PHONOGRAPHIC*

In the case of a "traditional notation" the sound event is created towards prescription of body movement. In the electronic music programming prescribe via the computer the movements of loudspeaker's membrane. We propose the notions of *ergographic* and *phonographic* in order to highlight two different kind of notation: the first one is used to prescribe movement of the body, controlling the instrument; the second one is conceived to control the movement of the loudspeaker. *Ergographic* defines prescription of movement as causes of sound based on the notion of note. In *Ergographic notation* composer indicates implicitly (or explicitly in the case of tablatures) the movements that must be used, interpreted, performed to create the resulting sound, as result of a final musical act. *Phonographic notation*, prescribes the movement of the loudspeaker towards the elaboration of information by the machines, indicating the precise parameters that compose the resulted sound.

4. NOTATION AS INSTRUMENT OF THE PAST, OF THE PRESENT AND OF THE FUTURE: NEW TIMES OF MUSIC NOTATION

Starting from this framework the author will try, in the last part of the paper, to propose a topology of notations from the point of view of their performative aspect. We define the structure of instrument-notational intentionality into three temporal dimensions and associate new means for musical notation to the following categories: notation of the past, notation of the present, and of the future.

4.1 Notation of the past

Notation is used to reconstruct a possible origin of a recorded sound event. It has the objective to represent, extract and transmit informations from a past event, recorded or memorized. The programs that allows the translation of information are numerous and used as basis of MIR analysis. Recently: Sonic Visualizer, MirTool Box, Tony etc. [11, 12].

4.2 Notation of the present

Notation as instrument of the present is conceived as a concrete performative means. The intentionality, as a complex amalgam of informations and projections is realized in the very moment of the transcription. Thor Magnusson [13] and Andrew Sorensen [14] provide through *Live Coding* examples of this new kind of instrumental relationship with notation. In a similar manner the live notations of Chris Fischer [15], Ryan Ross Smith [15] and Richard Hoadley [16] are instrument-notations built on an improvisational environment based on the instantaneous interpretation on the sign projected on the screen. This new form in instrumental relationship based on short term projections of prescriptions to the performers exalt the scenic presence of the notational means and in-

tegrate the act of writing with the traditional act of performing. In this context we can define two sub-dimensions related with two types of direct performance of notations oriented to the creation of instantaneous sound events.

Notation as instrument of the present on composer's "table": it corresponds to the studio dimension related with composition, in which the composer works in a quasi-perfomative environment with the computer. Thus the distance between the writing and the result is diminished: traditional scores, sketches, representations that allow the composer to control simulations in the sense of present intentionality projected in the immediate future, delayed and scaled in the direction of the further future. In addition to the traditional instruments of CAC there are more recent examples: Pierre-Alexandre Tremblay's *thinking inside the box project* [17], Rodrigo Costanzo's *dfscore* [18], Daniele Ghisi and Andrea Agostini's *bach* [19] etc.

Notation as instrument of the present, on the scene. The other one is on the scene, in which the score is used to create performances: *Live Coding*, score generated, read and interpreted at the same time and live notations: Chris Fischer, Ryan Ross Smith , Richard Hoadley, Cat Hope, Lindsay Vickery [20] and Aaron Wyatt [21]. This is the case for *Distant Mirrors* by Jean-Baptiste Barrière who claims:

> In this way, *Distant Mirrors* intends to put the performers in a situation similar to the "state of dream", in which you can recognize some elements but not all of them, many being alternately close or strange, in which you never know exactly what is going to happen next, you just have to adapt to the enigmatic course of events, and create your own interpretation of dreams [22].

Coherently with these developments Andrew Sorensen and Henry Gardner state that

> An *act of programming* is usually considered to sit firmly within the context of "software development", with the latter being the active process behind the production of "software products". In this view, causal actions made by the program- mer target the design and notation of a formal specification for *future* action by a computing system. [14]

4.3 Notation of the future

This dimension was the standard one of notations in the whole history of music. This approach still characterizes the actual compositional practice, extended via the instantaneous interaction in the studio. However, this typical interaction in western music is still represented, as in TENOR 2015 by Carlo Laurenzi and Marco Stroppa [23] and Pedro Rebelo [24].

5. FURTHER DEVELOPMENTS

This research has the objective to present a perspective that considers the musical act of writing, notating, as part of the musical act of performing. From the point of view of musicological research this framework has the objective to provide three descriptive categories for notation as instrument musical practices in electronic music. The author think that the proposed categorization could be part of a larger project of classification caracterized by the temporal features of notational-instruments. In fact the new tools for music notation and representation emerge under the notion of temporal instrument, that include the notion of *projectibility*, defined by Goodman, the notion of *embodiment* and *sound event,* and Anne Veitl's researches about the causal paradigm that se proposed. The new tools of music representation and performance provide a large reservoir of examples capable to support this perspective highlighting the new possibilities of the projections of actions, differed intentionality, in musical writing. Author's hope is that this framework can help researches to categorize the recent musical practice and to define, in the future, a topology of new notations from the point of view of performativity and temporality. Next developments will be characterized by the analysis of the new tools for music notation in relation with the enhancement and the depth of the theoretical framework proposed here.

6. CONCLUSIONS

Notation was traditionally used to prescribe future musical events. The new means for performance and notation break the temporal dimension of standard notation enlarging an essential element of notations, that is *performability*. Our research has the objective to frame theoretically this general problematic resumed under the definition of *notation as temporal instrument.* This definition is a direct consequence of the remarkable reduction of the theoretical distinction between the inner space of intentionality and the outer space of performance. At the same time this new performative territory from musical notation is already inscribed in the evolution of electronic means since the development of Music III. Nowadays notation is used to project intentionality in the present, the future and to reconstruct the past. The author try, with these framework, that is still in progress, is an attempt to provide a simple categorial means that allow a topology and more in deep description of new means for notation and performance in electronic music. The new notational techniques enlarge the temporal possibilities of the Instrument defining it as an instrument for the performance, a veritable performative means.

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