



InterPARES 2 Project

International Research on Permanent Authentic Records in Electronic Systems

Authenticity of digital music: key insights from interviews in the MUSTICA project

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1. Introduction

In 2003-2004, Jill Teasley, the UBC graduate research assistant affiliated with the MUSTICA project—General Study 03 of the InterPARES 2 Project—conducted interviews in French and English with composers and “musical assistants” associated with the Groupe de Recherches Musicales (GRM) of the Institut National de l’Audiovisuel (INA), or with the Institut de Recherche et Coordination Acoustique/Musique (IRCAM), two state institutions in Paris that support the creation and preservation of digital music. The interviews (anonymized, for privacy) have not yet been fully transcribed or translated into English. In the spring of 2005 Ms. Teasley posted 100 pages of “notes” consisting mostly of direct and paraphrased quotations from three of the interviews (MUSTICA-C1-AM1(20050411).pdf).¹ They make fascinating reading, and constitute a very rich source of information about the musicians’ compositional activities. Indeed, because of the quantity and variety of digital music that is created in these institutions, the interviewees are arguably among the leading authorities on practical issues surrounding its production and identity. Their institutions are also remarkable in their focus on preserving works for re-performance; the technicians thus are experts in finding ways to reproduce with current technology works that can no longer be presented in their original form, due to technological obsolescence.

In early 2005 it became apparent that the all the interviews could not be transcribed, but that their contents were so important that they needed to be more fully considered by the InterPARES team. The chairs of Domain 2 and Focus 1 decided that the interviews

¹ The notes are comprehensive. Ms Teasley was directed to take notes from the interviews and to record only pertinent information, but she was not given criteria to determine pertinence, and did not wish to impose her own views. She tried to capture as much as possible the interviewees’ word choices and manner of speaking, considering that these elements might reveal important information about the issues being discussed. The notes are not strictly verbatim, though: she did change many of the interviewees’ comments into third-person form, and for the most part she left out anything external to the issues being discussed, such as interruptions and exchanges relating to the duration of the interview. (Jill Teasley, personal communication).

should be reviewed and summarized in a structured way that reflected the most immediate goals of the project. Accordingly, graduate research assistants Jennifer Douglas, Carolyn Petrie and Claudette Rocan listened to the interviews and summarized their contents according to a template drawn up by the InterPARES Project for the analysis of case studies. The template consisted of 23 questions addressing how digital entities are conceived, created, described, associated, maintained and preserved. The questions for the original interviews were developed with this template in mind, so they covered many of its concerns about the nature of digital objects and their preservation.

On the basis of those summaries and the notes, then, this document attempts to summarize these experts' answers to the questions that address issues of authenticity—that is, how the composer and technicians conceive of the identity and integrity of the works they create, and how they have preserved (or imagine they might preserve) the works and their features across the rapid changes in digital music technology. This version of this document incorporates comments and corrections by Jill Teasley and Jennifer Douglas, and includes the insights of two additional interviewees. (After the first draft of this document appeared, Jennifer Douglas wrote a thorough summary of information gathered about MUSTICA; it is available on the InterPARES Web site.²)

In the discussion below, information from the summaries is cited by the interviewee's identity code and question number, for example “AM7, #4c,” while sources from Ms. Teasley's notes are cited by interviewee code and page number, for example “C1, 3.” English translations of the notes on the interviews of C1 and C2 are my own.

2. General observations about the nature of the works and their institutional context

Although creators do not describe their compositions in much detail, the works seem fairly diverse, involving varying mixtures of live performance, pre-recorded or processed sound, real-time invention, and interactivity. (In just one of these categories, interactivity, an interviewee distinguishes four subcategories. (C1, #7)) Thus, what is essential to one work may not be essential to another. Nevertheless there are enough similarities in the processes by which the works are created to make possible some general observations about identity, integrity, and the problems of preservation. Some of these similarities are evident in the consistent terminology the artists employ to describe the works and the creative process.

In the context of InterPARES, perhaps the most striking feature of these interviews as they are reported is that the subjects *never* describe music with the words “authentic (*authentique*),” “accurate (*précis*),” “reliable (*fiable*),” or with such synonyms as “genuine (*véritable*),” “true (*vrai*)” or even “original (*originale*).”³ (The sole application of the word “exact” in reference to recordings will be discussed below.) This is not to say that the creators are not concerned with preservation or that they have no conception of

² Available at http://www.interpares.org/display_file.cfm?doc=ip2_gs03_final_report.pdf.

³ The interview questionnaires were mostly void of these terms as well, to avoid influencing the participants' own use and understanding of these terms.

identity and integrity; quite the contrary is evident (although they don't use those words either!). But it may reflect the special situation that these works share: they are all commissioned, composed, and preserved in a special cultural and institutional context. The processes by which the works come into being clearly identify the composer as possessing the authority to determine the identity of the piece, and in nearly every case discussed in the interviews, the composer is still alive. Thus the authenticity of any supposed instance of a work is resolvable in every case by fiat of its author. For example, "after a migration is made, the composer and the assistant will listen to the new version together, and the composer will explain what is not correct in the new version at the level of sound (not at the technical level). It's up to the composer to listen to the piece and to find what should be changed ...[T]he [composer's] ears and the memory serve as witnesses" (C2, 68-9). "Correctness" in this instance seems to describe how accurately a particular version matches the composer's imagination of the work, and asserts the nature of a musical work as a mental conception, distinct from any particular manifestation of it.⁴ There are so few rewards for making this experimental music that there never arise issues of intellectual property, which might push the conception of a work to be more concrete.

3. What is essential to identity?

Interviewees acknowledge that many digital and non-digital entities contribute to the identity of the work, including digital sound recordings, machines, operating systems, common and custom-written software, documentation, contracts, and correspondence (C1, #4) (C3, #4). The association of all the entities pertinent to a work's identity is unsystematic and ad hoc, if it exists at all (AM5, #2). Invariably, however, the musicians focus on the sonic aspects of the pieces as essential. This is evident in the quotation above.

Some composers acknowledge a distinction between essential and inessential sonic features of their works, since they allow that certain specific features (e.g. reverberation, and even some of the sounds themselves) can be modified to match the performance space or means available, and will allow the "taste" of the performers to decide (C2, 55). But it's not clear how to generalize this. The boundary between essential and inessential seems to be different in each case, and when pressed the composers tend to assert that everything is essential (C2, 52-53). The spatialization of sound in the piece is most frequently cited as problematic in this context. If one insists that a work's identity hinges on a particular way of placing the sounds in the performance space, then one limits the possibilities of performance to venues in which that spatialization is possible; if one

⁴ According to Jill Teasley (personal communication), the authority of the composer is similarly apparent in the untranscribed interview with C7, "which, like most of the other composer interviews, discusses the alteration of the composer's music without his permission (C7, Track 33). C7 says that he is "furious" when this occurs, but that such alterations, to his knowledge, have always been due to other people's misinterpretations when performing his music and were not intended to change his music for the worse. This interview also includes some comment on C7's part about his collaboration with younger composers coming from techno backgrounds on performances of his own compositions. While the music is being represented in a manner that is different from C7's original intent, there is no question of who is the expert on the music's identity."

admits that the spatialization can be altered to suit the performance venue, then one admits that the spatialization of the piece is not essential (C2, 64-5).⁵

One musical assistant makes the striking claim that the essence of the piece is its “musical ideas.” “So there are three things -- ... important parameters [for example, specifications of spatialization patterns or rhythmic transformations], and a description of the musical idea plus the musical score, and then you have the essence of the piece” (AM1, 96).

This “essence” can be manifested in multiple ways. If, in the course of migrating a piece, the assistant discovers a more “clear” or “convincing” ways of expressing the idea, he may change the piece to achieve them, usually seeking the composer's approval to do so (AM1, 80, 92). Indeed, works can go through multiple versions as the result of evaluating how their ideas come across in performance (e.g. different acoustics of performance spaces can distort ideas) (AM1, 84). Most works seem to exist in multiple versions, some made as drafts of the first instance of the work, and others as the result of migrating the work to new technological platforms. For some works all earlier versions, although those that were authentic in their time, may be regarded retrospectively as drafts for the latest version, because their technology prevented some essential sonic features (such as reverb or spatialization) of the work from being fully realized (C2, 71-72). It is not the case, however, that no work is ever finished; composers and assistants will sometimes identify a particular version as the “definitive” one (AM1, 81).

One would think that in such cases that the essence of the work does not reside in specific technologies or procedures; what matters (as expressed in the quotation at the end of the last section) is simply the degree of match between the sonic result and the composer's aural memory. It is interesting in this connection that the word used in these institutions for “migration” is “*portage*” or, colloquially in English, “porting,” a term drawn from computer programming. “Porting” a computer program means to replicate its functionality on a hardware/software platform different from the original; it does not necessarily entail emulation of the original procedures.

Against this abstract characterization of the musical work, however, must be weighed statements that a work's identity is bound to specific means of sound synthesis (C2, 74). The composers' mental images are sometimes conceived with reference to particular technologies. In the case of one composition, running the original sound-generating

⁵ Historical considerations nuance the dichotomy I am proposing here. Spatialization may be important to even those composers who do not view it as essential to their works' identity, because it is “integral to the tradition of acousmatic performance, spatialization being the feature that differentiated the live performance of the prototype electroacoustic works by Pierre Schaeffer and Pierre Henry from a non-live performance. All of the composers interviewed work in this tradition, whether or not their music includes parts for live performers (which may limit the universality of some of the study's findings).”

Moreover, “a composer such as C13 (whose interview is not transcribed or analyzed at this time) may choose to never alter the spatialization of any of his pieces, and another composer, such as C2, who is aware of the practical purpose of spatialization (this being to make a pre-recorded piece sound its best in any space), may allow his compositions' original spatialization to be redesigned; in both cases, spatialization is an essential characteristic of the music being discussed.” (Jill Teasley, personal communication.)

procedures on modern equipment would produce sounds that are too “bright (*aigu*)” (C2, 56-7). It is not surprising, then, that one musical assistant—in contradiction to AM1 cited above—understands the works’ identity to depend crucially on its original hardware and software. He is pessimistic about the possibility of preserving the works he helped create, because he doesn’t believe the hardware and software can be preserved or emulated (AM7, #19). More on this, below.

4. So what is necessary to preserve?

Despite the abstract conception of works, reinforced by an institutional context in which living composers and their assistants identify authentic instances of works, the interviewees have thought about preserving the music past their lifetimes. Indeed the institutional mandate to keep commissioned works “alive” (AM1, 91) means they have accumulated vast experience in migrating pieces across several major changes in technology. Each has his own method, so collectively they are well positioned to make practical suggestions. For example, one of the musical assistants at IRCAM helps keep pieces alive by creating two distinct assemblages of material. The “*exploitation*” collection includes only the software and instructions needed to perform the work with its original instrumentation. The “*production*” collection (at least ideally) contains all the information about the work was created, so that (ideally) it could be realized again with different equipment (AM5 #17).

(a) Patches

“The death of a patch means the death of the composition” (C3, #19a).

One fundamental problem of preserving electronic music, if one takes the attitude that a musical work consists essentially of its sound patterns, is that electronic sounds, and the changes that they undergo, are so unusual. Textual descriptions of these sounds are inadequate (AM7, #19b, #23) (C3, track 44). All the interviewees therefore identify the necessity of preserving the instructions for producing, sequencing, and processing sounds. These instructions are known generically as “patches,” special software that specifies and controls the sound-production on particular computer platforms. “Patch” is a slippery term, but in some ways specifying a patch is like specifying the instrumentation of a traditional musical score. (Indeed, in the context of the composition program Max/MSP, which most of these composers use, a patch is represented visually, making it analogous to the score itself.) Just as one cannot imagine a symphony without an orchestra of instruments for which it was written, the interviewees cannot imagine a work to exist without its patches. Some philosophers (e.g., Levinson) understand the identity of earlier musical work to be tightly bound to their “performing means,” that is, the particular instruments or voices for which they were composed. If one understands “patches” to be “instruments,” this conception seems to be appropriate also for the digital music studied here.

The technological context of the patches is fairly common in the world of electronic art music. It involves software that is off-the-shelf commercial or proprietary (e.g. developed internally by GRM) for the creation, processing, and sequencing of files that encode

musical sounds either directly (as digital audio) or indirectly (as instructions for controlling digital musical instruments). The software involves proprietary data structures that are not in the public domain, and it operates on computers running commercial, proprietary operating systems. As input, the software may take signals from other devices, typically those that monitor the sound and motion of live musicians. As output, the software sends signals to audio- or video-producing equipment. All input and output devices have specific technical characteristics that are implicit features of the composition, just as the technical characteristics of a violin constrain the music for violin. Thus, a musical assistant observes that it is not sufficient to preserve the instructions for a composition (e.g., the patch), one must understand how the interpreting program (e.g., Max/MSP) functions. And if a patch processes other sounds, then keeping patch alone, without source sounds, is not sufficient (AM2, 21).

Although patches are written for specific technology, they often consist of “modules” that can be preserved. Some modules—harmonizer, pitch follower, envelope follower, score follower, frequency shifter, delay, attack detector (AM1, 94-100)—are universally known in the electronic music world, and constitute a “bedrock of technologies” that must be migrated, just as pianos or violins must be preserved in order to perform earlier music (AM1, 100). The pieces “sit on the bedrock.” They may also include non-standard procedures/software, but those must be carefully documented (AM1, 95). The resolution (or other relevant technical properties) of these processes must be specified (AM1, 97). Clearly much other information must be preserved along with the patches.

(b) Recordings

“Somebody who does the porting of a piece, to really do his job to the limit must have a rather good perception of what the piece sounds like performed. So it’s not just simply a technological operation of saying well, ‘in language X this is the way you write it, and language Y this is the way you write it,’ and that’s the end of it.” (AM1, 85)

Interviewees agree that a recording of the sound patterns does not preserve the work. No recording is “exact” or “precise” (C1, 18), because it cannot manifest all the essential features of the work, and because it records mistakes in performance, and because it cannot present the balance of sounds the composer has conceived for a live presentation of the music. Moreover, “music isn’t only listening”—it is also watching people playing (C1, 20-21).

Nonetheless, the interviewees regard recordings as essential to preservation. For example, musical assistant AM3 describes a procedure for migrating that mostly involves migrating the patches—achieve the same sounds and sound processes on a different technological platform. Even though he has invented a way of migrating that uses “text” files as intermediary representations of essential data, so avoiding problems of proprietary data, he says that he must have a recording for comparison (AM3, #6, #19a).

Recordings are seen as the only substitute for the living composer’s authority. “Thus the only criterion [for authenticity] that can be really valid is a musical criterion which is

validated by the ears [*qui passe par les oreilles*]. And so when the day comes that there is no longer a living witness, there will need to be a recording.” (C2, 70-1)

(c) In some cases, emulate or perish

Given the diversity of music under consideration, it is not surprising that interviewees had diverging views. Some assert that a work's identity should not depend on technology (AM3, #10). But one assistant maintained that some works simply cannot be migrated; they are so bound to their original performing means that any “reinterpretation” through migration would change their identity (AM2, 19). The only options for preservation, then, are to preserve the original machines and software (AM2, 5a, 6).⁶ Clearly this is only possible in the long run through emulation.

5. Caveat and conclusion

The notes and summaries reviewed here represent only a sample of the interviews conducted as part of the MUSTICA project. One should not assume that the views presented above represent a complete view of the problem, or even a consensus. Given the special institutional context in which they arise, they may not even be representative of the views of other composers of digital music. Nevertheless, the interviewees are quite articulate about the nature of their work, and represent an important community of musicians. If they see the need to preserve a “bedrock” of commonly used patches, along with recordings, we can take those views at least as a starting point for discussions with other creative artists.

⁶ This view is shared by research participants whose interviews have not been transcribed or analyzed at this time, for example C10 and C14 (Jill Teasley, personal communication).