InterPARES 2 Project
International Research on Permanent Authentic Records in Electronic Systems

Overview

General Study 03:
Preserving Interactive Digital Music –
The MUSTICA Initiative

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The Creator Context/Activity

The MUSTICA research project, established in the spring of 2003, is an initiative of the InterPARES 2 Project. It is composed of an international team of archivists, information scientists and musicologists and seeks to develop tools to guide the preservation and presentation of interactive digital musical compositions in accordance with the standards and strategies for electronic records preservation as defined by InterPARES 2. Its core mission is to increase the ability of composers and archivists to preserve and access the records associated with the creation, performance and reception of interactive digital music.

MUSTICA seeks to draft preservation guidelines for both records creators and archivists who deal with digital music compositions and their records. The project collaborated with two French institutions, the *Institut de Recherche et Coordination Acoustique/Musique* (IRCAM) and the *Groupe de Recherches Musicales* (GRM). The two institutions are very prominent organizations in the field of digital music composition and preservation and regularly commission interactive digital music. Founded in 1948, the GRM is a pioneer in the development of methods and techniques of electro-acoustic composition and software, whereas the IRCAM, founded in 1972, is a prolific producer of composition software and hardware.

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Documentary Practices Observed

Record Creation and Maintenance

One of MUSTICA's objectives is to propose and test strategies to support the continued access to information about the generation of digital compositions. In keeping with this objective, the project seeks to approach preservation in what may seem to be an ironic way: by addressing the issue at the creation phase of a composition, as well as throughout the use phase by developing and testing appropriate metadata for each phase.

Since the MUSTICA project recognizes that for a digital musical work to be adequately preserved, preservation issues must be considered from the very inception or creation of a work, the creation process of digital compositions must be informed by the desired outcome of adequate preservation of the records to be created. As a result, two of the questions for which the project seeks to find answers are: 1) How should the phases of development of a work of music be retraced? and 2) How should the conditions of its composition, reception and interpretation be characterized?

With these questions in mind and with the goal of determining adequate long-term preservation techniques, the MUSTICA researchers examined the procedures, equipment and activities associated with the creation and performance of interactive digital compositions in order to determine the nature of the records that are essential for the future interpretability of a wide range of types of interactive digital music compositions. This was achieved through the identification of the intellectual and physical components of the records of digital music.

Despite the fact that "most works seem to exist in multiple versions," some of which are the result of drafts and others as the result of migrating the work, "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."[1]

Although "what is essential to one work may not be essential to another…there are enough similarities in the processes by which works are created to make possible some general observations about identity, integrity and the problems of preservation." (Roeder, 2)

One of the crucial records that must be created in the course of producing a work of digital music is a list of instructions for producing, sequencing and processing sounds. In the world of digital music, these instructions are generally known as "patches" and are the sort of enabling records that are required if the work is to be re-interpreted in the future in the absence of the physical presence of the composer. "A patch is represented visually, making it analogous to the score itself." (Roeder, 5) Since the patch is an essential record that must be preserved, it is also essential that the composer create such a document to give the necessary instructions for performing the piece of music.

Recordkeeping and Preservation

Generally speaking, the question of preservation is a difficult one in relation to electronic music, especially interactive musical compositions. This is because a wide variety of specialized (and sometimes custom-made) electronic components is required for the performance of these types of compositions. An interactive digital music composition is typically comprised of many different types of documents that are the electronic equivalents of the conductor, score, instruments and performers of the work. "The records of a composer working in a digital environment might include a finished score in electronic form, MIDI files and copies of electronic correspondence regarding the performance of a particular piece."[2]

Preservation becomes complicated because all of these numerous components of the musical work must not only be preserved individually, but also in their relationships to the other components of the musical work, in order for that work to be correctly rendered over the long

[1] John Roeder, "InterPARES 2 Project - General Study 03: Authenticity of digital music: key insights from interviews in the MUSTICA project," p. 4. Available at http://www.interpares.org/display_file.cfm?doc=ip2_gs03_authenticity_roeder_v2.pdf.
[2] Bruno Bachimont, Andrew Gerzso, Anne Gillilant-Swetland, Olivier Lescurieux, Pierre Morizet-Mahoudeaux, Nicolas Donin and Jill Teasley, "Preserving Interactive Digital Music: A Report on the MUSTICA Research Initiative," in *Proceedings of the Third International Conference on Web Delivering of Music (WEDELMUSIC 2003), 15-17 September 2003, Leeds, UK* (IEEE Computer Society Press, 2003).

term as the composer intended it to be. However, "the association of all the entities pertinent to a work's identity is unsystematic and *ad hoc*, if it exists at all." (Roeder, 3)

The already precarious nature of digital music preservation is rendered even more difficult or unlikely due to the fact that by the very nature of their work, composers are creators, not preservers. That is to say that composers generally lack the knowledge of how to preserve the records of their works, and if they do have the initiative to do so, they often lack the means to properly carry out preservation. In addition, "composers may be more inclined to pursue new projects rather than take on the arduous task of organizing their records, and they may not perceive uses for the records other than those for which they were originally intended (i.e., the composition and performance of a musical work." (Bachimont, 2) There seems to be a general lack of re-use or re-purposing among the digital composers studied. Re-use and re-purposing are often cited in other areas of the arts and in business settings are the main reasons for preserving documents. Also, composers differ on what is necessary for the identity and integrity of their work and have a tendency to view their entire documentary output as essential. "The boundary between essential and inessential [elements] seems to be different in each case, and when pressed, the composers tend to assert that everything is essential." (Roeder, 3)

To adequately preserve the records of digital music compositions, two things are necessary: First, to determine which of the various components of the work are the necessary records that form its identity. Secondly, certain procedures must be identified to ensure the work's continued interpretability.

Part of ensuring the continued interpretability of a work in the future includes allowing for accurate representations of the contexts in which digital works were created, performed and received. As a result, it may not only be necessary to preserve all versions of a digital work, but also the pertinent information on the context within which each version was created. "Future archivists and would-be interpreters may be prevented from thoroughly investigating a composition if its composer retained insufficient documentation of versions." (Bachimont, 3)

Ensuring continued interpretability also includes finding ways to get around the problem of technological obsolescence. One of the main aims in the preservation of interactive digital music is to find ways to "reproduce with current technology works that can no longer be presented in their original form." (Roeder, 1)

Although the patch is an essential record to be preserved for digital music, "it is not sufficient to preserve the instructions for a composition (e.g. the patch), one must understand how the program (e.g., Max/MSP) functions…Clearly much other information must be preserved along with the patches." (Roeder, 6)

The various preservation strategies that have been suggested so far for the preservation of digital documents in general may be applied in different ways or to different degrees for the preservation of digital music compositions. These include emulation, migration and encapsulation.

Migration is not sufficient on its own. It needs to be combined with a recording of the work. Even though the recording does not preserve the work, there must be a recording that can be used as a point of comparison after migration. "Recordings are seen as the only substitute for the living composer's authority." (Roeder, 6)

Because some experts believe that some works cannot be migrated or that any migration constitutes a reinterpretation of the work and thus changes its identity, "the only options for preservation, then, are to preserve the original machines and software." (Roeder, 7)

Accuracy, Authenticity and Reliability

"Perhaps the most striking feature of these interviews…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*)." This situation may be due to the fact that the works are all commissioned, composed and preserved in a "special cultural and institutional context." (Roeder, 2)

Accuracy

When a work is migrated, the composer and musical assistant listen to the migrated version and "the composer will explain what is not correct in the new version at the level of sound… 'Correctness' in this instance seems to describe how accurately a particular version matches the composer's imagination of the work." (Roeder, 3)

Authenticity

One of the questions that the MUSTICA project sought to answer is how the musicological concept of authenticity differs from that of archival science.

In regards to digital records, the term *authenticity* is understood in an archival sense as encompassing the identity and integrity of the electronic document. That is to say that the digital document must be "continually accessible in its intended form and kept safe from tampering or unintended modifications." (Bachimont, 1)

In the case of the works commissioned by the two institutions, "the processes by which the works come into being clearly identify the composer as possessing the authority to determine the identity of the piece…Thus, the authenticity of any supposed instance of a work is resolvable in every case by fiat of its author." (Roeder, 2-3)

However, the question of authenticity is problematic once the author is no longer living. In that case, "recordings are seen as the only substitute for the living composer's authority…When the day comes that there is no longer a living witness [the composer], there will need to be a recording." (Roeder, 6)

Reliability

"No recording of a digital work is 'exact' or 'precise,' because it cannot manifest all the essential features of the work, because it records mistakes in performances and because it cannot present the balance of sounds the composer has conceived for a live presentation of the music." (Roeder, 6)