MUTABLE SCORES: EMBRACING NON-FINALITY IN NOTATION

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ABSTRACT

In Western art music, a work is commonly understood as a discrete and final entity, instantiated through a score or fixed instructions that govern its recreation. Although various practices experiment with a score's determinacy, few musicians have envisioned a work's notation as a continuously evolving and perpetual process. Drawing primarily on an analysis of Lydia Goehr's work-concept, this paper first examines how works are largely perceived as finished entities. It then presents Lauren Redhead's iterative compositional approach as a case study of scores deliberately designed to resist finality. Building on this framework, the paper introduces the mutable score through the examination of a composition currently in development. The proposed model supports perpetual adaptation, reworking, and recontextualization, treating iterations not as derivatives but as active components of an ongoing compositional process and traceable records of the work's evolution. The paper further considers how such iterations may be documented, preserved, and circulated to remain operative in subsequent realizations.

1. INTRODUCTION

In *The Imaginary Museum of Musical Works*, philosopher and musicologist Lydia Goehr articulates the work-concept: the conditions and ideals that regulate Western musical practice and the creation of musical works [1]. In her broader examination of the work-concept, Goehr offers the following account of the perception of musical works in the centuries prior to its emergence around 1800: "Music was not always produced to outlast its performance or survive more than a few performances. And when it did survive many performances, numerous changes could and usually would be made to the music in the process. Rarely did musicians think of their music as surviving past their lifetime in the form of completed and fixed works. When musicians thought about repeatability, they thought more of the multiple uses of themes and parts for various different occasions, than of one and the very same whole composition being repeated in performances dedicated to the performing of that very composition." [1, p.186] According to Goehr, the emergence of the work-concept established a clear separation between the musical work and its performances, framing the work as a discrete and final entity.

Many experimental practices and ontological discussions engage with the level of determinacy of a work and the variation among its individual representations. However, even in cases of maximal indeterminacy, the work's notation is still largely understood as a definitive set of instructions for recreating a finalised composition.

Drawing on a creative process developed by Lauren Redhead, this paper seeks to further engage with finality by imagining the score [1] as an ever-evolving and perpetually unfinished element of a work. From there, it proposes the mutable score as a new approach to composition and notation, where non-finality and iterative transformation are integral to the work from its inception.

2. THE FINALITY OF WORKS

This section argues that finality is ubiquitous in the Western perception of musical works, and that the work-concept's pervasive influence extends even to practices that exist outside its framework or explicitly seek to challenge it.

2.1 Ontology and authenticity

Firstly, to consider a musical work as final, it is necessary to distinguish the work itself from its various instantiations. The finality of a work does not imply uniformity across performances, recordings, or other realizations. In *The ontology of musical works and the authenticity of their performances*, Stephen Davies [2] contends that multiple performances of a musical work, even if they vary greatly in how they are realised, can still be considered realizations of a singular work. In fact, as Davies points out, an authentic realisation of a work may involve significant variation between instances [2], and even inauthentic realisations which vary by misrepresenting the work in some way, are still perceived as the same work [2]. Davies also includes adaptations or score modifications, such as re-scoring a piece for different instruments, by noting that such performances "may be recognisable as a performance of a particular work even if it is not possible to recover all of the work from the performance" [2].

[1] In this context, the term score is used broadly. It refers not only to traditional notation but to any set of material instructions that indicate how a composition may be realized.

[2] Davies gives the example of a baroque piece with figured bass. The figured bass may be executed in diverse ways across instantiations; nonetheless, other more determined features maintain their identity as a single work.

Davies' analysis emphasizes that the musical work exists independently of any particular instantiation, a perspective reflected in Goehr's articulation of the work-concept. This independence allows the work to retain its status as final, even in the absence of a definitive or "true" version of its performance. Thus, a musical work and its score is generally considered finished and complete, despite variations in interpretation.

2.2 The pervasiveness of the work-concept

The final chapter of *The Imaginary Museum of Musical Works* describes the pervasiveness of the work-concept: "the romantic aesthetic originally provided has continued, since 1800, to be the dominant view. This view is so entrenched in contemporary thought that its constitutive concepts are taken for granted. We have before us in fact a clear case of conceptual imperialism" [1, p.245]. As Goehr notes, musical practice is interpreted through the framework of the work-concept, even when the composer did not conceive it in those terms. Through "conceptual imperialism", the ideals of the work-concept then infiltrate practices that do not traditionally operate within its framework.

Jazz music, for example, does not typically adhere to the work-concept, foregoing the score and the work in favor of the chart and the standard. Yet, according to Goehr [1, p.250], some jazz musicians adopt the "institutional conventions" of the work-concept, to achieve the perceived authenticity of "serious" music. Michael Talbot similarly identifies a broader shift within Western musical culture from performance-centered practices toward composer-centered ones [3]. Both authors point to the professionalization of the composer and the commercialization of music as forces encouraging the conception of works as distinct, authored, and complete entities capable of repeated realization by performers [1, 3].

Even the most experimental approaches that seek to explicitly question and disrupt the norms of this model are paradoxically engaged with it. John Cage's work *4'33"* (1952), mentioned by Davies, Goehr, and Talbot, provides a compelling case study that appears to deliberately depart from the ideals of the work-concept. While the work seeks to relinquish all compositional control, challenging "formal notions of pre-composition, fixed instrumentation, repeatability, and compliant performance" [1, p.262], it fails to completely detach from the mainstream perception of a work as finished entity. For a range of reasons, whether professional and commercial pressures tied to the recognition of the composer or the force of institutional conventions, in *4'33"* and other similar works "the formal constraints of the work-concept have ironically been maintained" [1, p.263]. Tellingly, the score was published by Edition Peters in a conventional, typewritten format, first in 1960 and again in 1986 [4].

As illustrated above, the ubiquity of the work-concept allows experimental works such as *4'33"*, which almost entirely remove composer intervention, to be understood as final, authored, and repeatable. As will be discussed in the following sections, even where works engage with determinacy in unconventional ways, the condition of finality is largely maintained.

2.3 Determinancy and finality

Contemporary works and notations operate across varying degrees of determinacy, some allowing for maximal liberty in the performer's interpretation while not straying into the purely improvisational. Goehr remarks that the composer's intent, and the performer's faithfulness to it (*Werktreue*) are the differentiating factors between the performance of a work and an improvisation:"There is a significant difference between performers who comply with a notation which specifies that they play what they will for as long as they want, and in so doing perform the composer's work, and performers who improvise freely around themes because that is what it means to produce their sort of music. What is absent in the second case, but what is present in the first, is the performer's commitment to Werktreue." [1, p.263] This illustrates the flexible nature of the work-concept regarding the determinacy of realizations, allowing for even the most open and free forms of notation to be considered finished and authored entities, of which each performance or recording is an instantiation.

On one extreme of the determinacy spectrum, the performances of open scores, such as Cornelius Cardew's classic work *Treatise* (1967), could be wholly unrecognizable from one instance to another, yet would be considered as instances of a singular finished work represented in a fixed notation. In the introduction to *the Treatise Handbook*, Cardew explicitly distinguishes between the completed score and the accumulated experiential knowledge of the work: "However, the years of work on Treatise have furnished me with a fund of experience obviously distinct from the experience embodied in the score itself. And this fund continues to accumulate, since my experience of and with the piece is by no means completed with the completion of the score;" [5]. While *Treatise* and similar scores bring into question what proportion of the work resides in the score or in each individual performance, the work is still finalized through its completed notation. This example demonstrates that the work-concept's condition of finality can encompass even maximal variation between instances, indicating that finality cannot be challenged solely through indeterminacy.

3. NOTATION AS A PERPETUALLY ITERATIVE PROCESS: THE CASE OF LAUREN REDHEAD

As demonstrated by Davies and Goehr, the condition of finality is evident across a broad range of works, regardless of determinacy or attempts by composers to resist the conventions of the work-concept. While certain practices attempt to remove as much composer control as possible, exploring the limits of determinacy, finality, defined here as the understanding of a work and its score as a finished entity, of which each performance or recording is an instantiation, is more rarely probed. As Talbot and Goehr suggest, professionalization and commercialization certainly play a role in the need for even the most avant-garde composers

to adhere to the work-concept, and to be seen as serious composers of completed musical works [1, 3]. One contemporary composer who deliberately addresses finality in her work is Lauren Redhead, whose compositions will be examined as a case study to inform the subsequent discussion of mutable scores.

Redhead engages directly with the notion of finality through her approach to the composition and notation of two of her works: *ijereja* and *entoptic landscapes*. In these works, composition, notation, and interpretation exist as iterative processes that could extend indefinitely. The scores of these works are continually re-notated and directly include elements from previous iterations: "In the case of each piece, materials created in and by previous performances go on to inform future performances of the music. As such, there can be no 'definitive' performance or statement of the works, and nor can they ever be considered finished or bounded." [6]

According to Redhead, notation in the traditional work-concept is understood as a set of instructions that allow for the recreation of a work, and a material preservation of the musical idea [3] : "As such, notation is always outside of the work, as a form of documentation, rather than inside the work, as a part of its creation or re-creation." [7] Her approach to composition, which she describes as a perpetual "re-performance" of notation, repositions the score as a "work (labour) of notation and not as a representation" [7]. By including notation in the ongoing work, an active and living element that is recreated iteratively, Redhead's works engage with the finality condition of the work-concept. The notation is not only adapted or modified to fit different contexts or instruments, but part of a perpetually unfinished work.

In the same way that a score's interpretation evolves over time—each performance and recording imparting nuances that shape the musician's understanding of how the piece might be played—the scores for *ijereja* and *entoptic landscape* are marked by traces of their past iterations. These traces include not only fragments of past versions of the score, but also elements adapted from recordings of performances integrated into subsequent iterations of the notation. The nonstatic score and its evolving interpretation become mutually dynamic, each continually impacting the realization of the other.

While describing *entoptic landscapes*, Redhead reflects on the work's renewed status under the work-concept: "In this way, the piece can both be considered complete and expanding: it reacts to its performers, performance circumstances, and internal contradictions in an ongoing series of iterations." [6] Despite their lack of finality, *entoptic landscapes* and *ijereja* are works. Just as performances or recordings are considered instantiations of a singular work, the scores can be similarly understood. Interestingly, this approach allows the same work to exist in different forms, including determinate or indeterminate notation, or even installations or other formats [4] .

Finally, the works are cumulative. As Redhead explains while discussing *ijereja*: "This process is one of accretion, in that more materials of all types may be subsequently drawn into the project without changing its identity." [7] While all works intended for multiple recreations accumulate performances or recordings over time, these two examples extend this accumulation to include the scores themselves. These materials are not separate streams of iterations but influence one another in an evolving network. In her essays on the works, Redhead does not delve into how or if the material trace of each iteration is preserved, or if they are kept distinct from one another. While the works include all past materials accumulated to that point, it is not clear if she considers each iteration as a distinct snapshot of the work, or if the work is more of a palimpsest, each new addition overlapping the previous and obscuring the separation between layers.

My proposed approach, developed throughout the rest of this paper, similarly envisions a work that is perennially non-final. It adopts Redhead's accumulation process but sets itself apart by emphasizing and preserving individual iterations as active elements in a perpetually evolving work.

4. TOWARDS A MUTABLE SCORE

I propose the mutable score as my own approach to notation and composition, designed to adapt and evolve indefinitely, each generation building on the last, inheriting some traits while abandoning others. In parallel with Redhead's approach, it engages with notation within the work-concept by suspending the condition of finality typically associated with it, while highlighting the ongoing relevance of each iteration. This section opens with a description of a score currently in development, created to test the mutable score approach, and then uses this experimental score to illustrate three core components of the method.

4.1 Mutable experiment

mutable experiment is an ongoing work created to explore a perpetually evolving form of notation. It functions as a tool to test and develop the mutable score approach through practice-based research. The objective is to enable the notation to evolve over multiple iterations, adapting to different contexts and intentions, while preserving a material trace of each stage. In this way, each produced score continues to exist as a living element of a perpetually non-final work that can be reused in further versions or consulted to inform further compositional decisions.

The first iteration of the score, of which an excerpt is pictured in Fig. 1, was created with a Max for Live device currently in development at the University of Montreal's Laboratoire formes • ondes [5] . The device allows users to produce scrolling, animated graphic scores directly in Ableton Live by assembling PNG images of symbols and shapes. The scores are then played back to the musicians

[3] Redhead cites Christopher Williams' "prescription-preservation model of the score"

[4] Redhead, on *ijereja*'s multiple formats:"Today, the piece encompasses several live acousmatic and multi-channel performances, a studio album, multi-modal gallery presentation, audio-visual installation, scores for specific instruments and open notation." [6]

[5] More information can be found here: https://lfo-lab.ca/notation-performative-en

to guide performance. The composition of the first iteration was guided mainly by visual aesthetics, using an open form of notation to allow a large amount of flexibility in interpretation. Since the score was expressly created to evolve, this approach was selected to encourage a multitude of musical ideas to emerge, which could then inform the next generations. The graphic form was chosen to allow a multitude of instruments to be used, including my own modular synthesis and feedback-based systems.

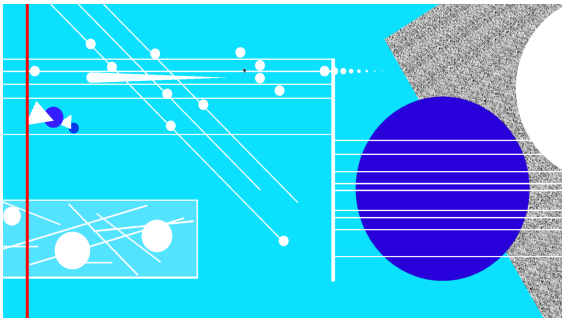

Figure 1. excerpt from the first iteration of *mutable experiment*.

The first version of the score was performed in a studio session, with an experienced classical guitarist on electric guitar and pedalboard, alongside my performance on a no-input mixer system and modular synthesizer. Little instruction was given prior to the session, and multiple different interpretations were recorded. Constraints included a fixed length of 3 minutes, and a scrolling playhead (pictured in red in Fig. 1 and Fig. 2) to allow the musicians to follow the score at the same pace for each repetition. This proved useful for the subsequent examination of how the symbols were interpreted, allowing a direct comparison of different interpretations.

The recordings from this session were not intended for publication, but rather to inform the next generation of the score. An arrangement was created from different segments of these recordings, from which another graphic score (see excerpt in Fig. 2) was developed using the same score creation and playback device. This new score inherited certain traits from the previous version while discarding others, yielding a more determinate score intended to more closely reproduce the assembled materials.

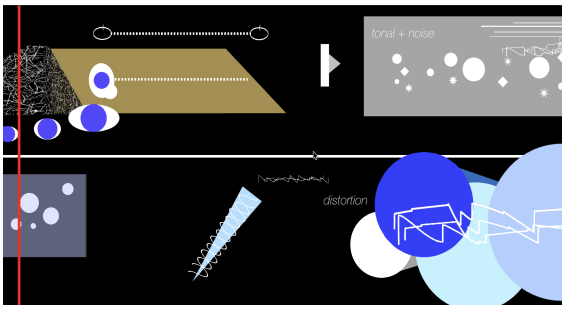

Figure 2. excerpt from the second iteration of *mutable experiment*.

This score was also performed in a studio session to obtain recordings that will inform future generations. From this point, the score will diverge into two distinct versions: a graphic score in open notation allowing free interpretation of symbols, and a more determinate score combining traditional notation with graphic scoring methods (see Fig. 3). This generation is currently in progress.

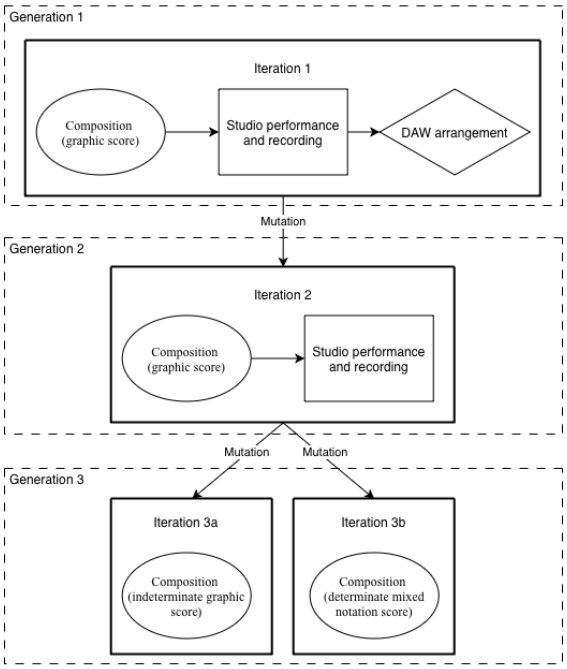

Figure 3. Diagram of the first three generations of *mutable experiment*.

It is important to note that, in keeping with the mutable score approach described in the following section, each version of the score is preserved as a living component of the work as a whole. Accordingly, each iteration of the score should not be understood merely as a step toward a finalized version, but as an ongoing element that may be re-performed in its own right, transformed into divergent versions, or consulted as a trace of the work's evolution.

4.2 Characteristics of the mutable score

Drawing on *mutable experiment*, this section outlines three principal characteristics of the envisioned mutable score approach.

4.2.1 Mutation

Mutation in the biological sense is one of the primary methods by which species evolve, allowing for the emergence of new characteristics that can be conserved through natural selection. The mutable score evolves in a similar manner, retaining or discarding traits through generations in response to the composer's intentions and needs.

This process reflects R. Keith Sawyer's conception of creativity as iterative and improvisational, involving continual movement between its various stages, rather than a linear progression from idea to execution [8]. A composer of a new musical work does not immediately produce a fully

formed and definitive idea, which is then passed on to musicians who execute the instructions to the best of their ability. Instead, the composer engages in a recursive negotiation between the musical idea and its realization. Henrik Frisk and Stefan Österjö [9], describing the process of adapting a musical idea for the harp, offer an account of this process in action. First, the initial musical idea is transcribed into notation but is unplayable on the instrument. Working with a harpist, multiple iterations of the same musical idea are tested. Changes (mutations) are retained or discarded between iterations until a balance is reached between playability and adherence to the original idea.

In contrast to the work discussed above, where iteration and selection shape a musical idea and score into a final form, the mutable score is allowed to evolve indefinitely, incorporating new ideas as spontaneous creative developments or reactions to the needs of new presentation contexts and formats. This process would differ from a simple adaptation, where the musical idea is modified to allow it to be played as faithfully as possible on a different instrument, such as a piano reduction of an orchestral work. Instead, the mutable score is conceived to not only adapt to the parameters of a new presentation, but to permit the modification of the musical idea itself as well as its instructions for recreation. The *genetic material* of the work — the music, the score, the form — can thus progressively evolve, yielding instances with high degrees of variation, yet still tied to the same work by a common traceable genealogy.

In the case of *mutable experiment*, mutation manifests in multiple forms. Studio recordings enabled the identification of score elements whose interpretations were deemed effective and subsequently carried forward into the next iteration. Fig. 4 illustrates the evolution of different symbols from generation 1 (blue and white) to generation 2 (black, grey, and white).

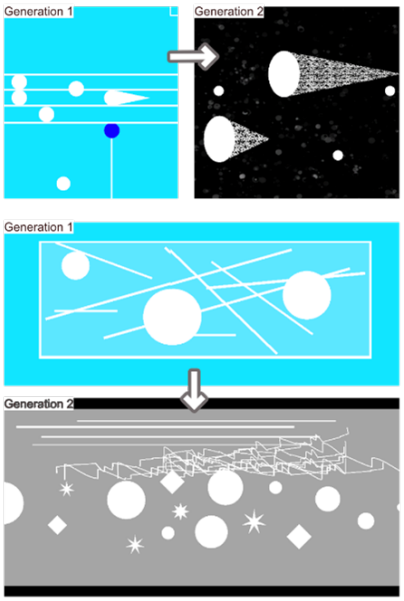

Figure 4. evolution of symbols from generation 1 to generation 2 of *mutable experiment*,

In the third generation, mutation is expressed through the evolution of the score from an indeterminate graphic notation to a more determinate mixed notation. As illustrated in Fig. 5, the continuity between symbols across generations remains evident, even as the score evolves not only in content but also in form.

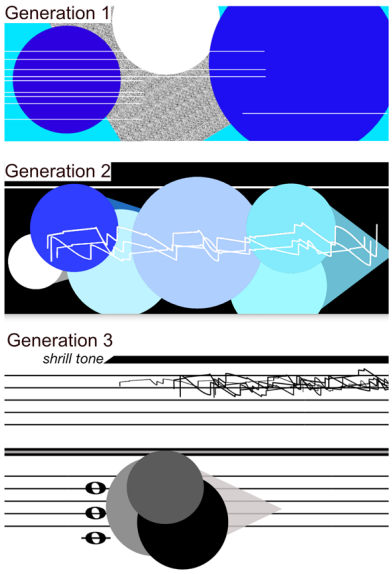

Figure 5. evolution of a symbol through three generations of *mutable experiment*,

4.2.2 Phylogeny and genetics

The perpetual mutation of the score allows, as Redhead describes, the "re-performance of notational labour", inserting notation "inside the work" [7]. However, the mutable score differs from Redhead's approach by its emphasis on the genealogy of the score and the record of its evolution. Phylogeny, the study and representation of evolutionary history, provides a useful analog for the hereditary and iterative nature of the mutable score. Through a phylogenetic approach, the evolution of the score can be traced and analysed throughout its iterations, allowing the work to exist as a single continuous entity with multiple evolutions and divergent points. Even if progressive variation produces seemingly unrelated instantiations, their lineage can be traced to common points of divergence.

Taking *mutable experiment* as an example once again, although early generations maintain significant similarities, successive evolutions could produce scores that share little with the earliest versions. The diagram of its iterations (Fig. 3) would extend through evolutions and divergences, resembling a phylogenetic tree, as depicted in Fig. 6. In this case, the identity of the work as a singular continuous entity is assured by its genealogy and the traceable link between each generation. The work can thus be understood as a continuous compositional process rather than a series of drafts leading to a final proposition.

Nicholas Donin's work, which includes genetic analysis in music studies, highlights the potential of preserving a material trace of a work through its compositional

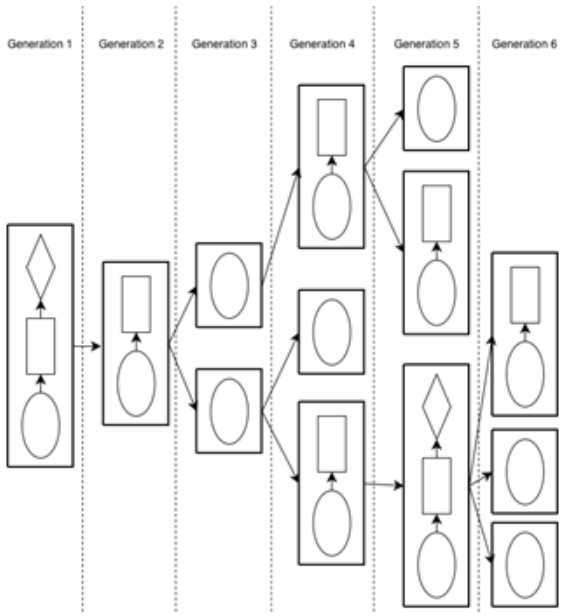

Figure 6. Phylogenetic tree of *mutable experiment* including potential future generations,

stages. According to Donin, musicology alone seems insufficient to establish composition as an autonomous object of study [10]. Including genetic analysis—the study of a composer's creative process and its material artifacts, such as notes, drafts, and score versions—offers new perspectives on works as well as new creative possibilities. Through this approach, Donin emphasizes the compositional process as an integral part of the work, a perspective that aligns with Redhead's iterative composition and the mutable score approach outlined here. In discussing a research project on the genetic analysis of Philippe Leroux's 2002 composition *Voi(rex)*, Donin explains how the work's genetic record was used to inform the creation of multimedia devices that highlight listening traits noted by the composer and also led to a new composition by Leroux reusing ideas, materials, and techniques from *Voi(rex)* [10]. Notably, this evolution of the work into two divergent iterations echoes the ambitions of the mutable score.

4.2.3 Preservation

As mentioned previously, the material traces of each iteration of the mutable score must be preserved to allow the tracing of its evolution through documentation and chronological organization. Documentation need not capture every incremental change; instead, it should emphasize key stages or critical divergences.

Preserving the different iterations is a crucial aspect of the mutable score. Whereas the evolution of a traditional musical work must often be painstakingly reconstructed from the analysis of a composer's notes and comments [6], those involved in creating a mutable score are responsible for maintaining its genetic record from the very outset of the process. Preservation is what allows the mutable score to function and what differentiates it from other forms of composition and notation, allowing previous iterations to remain useful over time and maintaining the status of the work as a continuous entity. Thus, preservation, like notation, is incorporated into the ongoing performance and labor of the work, as an active part of the compositional process, with composers shaping the genetic record through selection and documentation.

Multiple strategies could be employed for preservation, facilitated by modern technological advances in documentation and storage. While they will not be discussed in detail here, the field of software engineering could be rife with potential solutions, as preservation of data through iterations is critical to modern software development practices [7].

5. COLLABORATIVE MUTABLE SCORES

The mutable score concept is still in its early stages and, for now, is confined to my own practice while it is further developed. In the long term, it is envisioned as a means of fostering and facilitating collaboration, becoming an open-source project available to a broader community. In the intended implementation, the entirety of the work, including all iterations, will be made publicly available, allowing anyone to continue to iterate on and evolve the work as they see fit. By encouraging contributors to engage with an evolving work and freely adapting the score and its materials, a single mutable score could diverge into autonomous branches, with the expectation that such modifications be documented as part of the work's ongoing development. Here again, parallels can be drawn with software development, where open-source models encourage collaboration and reappropriation, while preserving authorship and agency over one's work [8].

6. CONCLUSION AND NEXT STEPS

This paper outlines the conceptual and methodological scaffolding on which mutable scores can be built. It demonstrates the ubiquity of finality within Western music practice to propose a new method of scoring and composition that explicitly seeks to resist it. This model, in addition to challenging finality, highlights the potential afforded by the documentation and preservation of the material trace of a work through its evolutionary stages. Ultimately, it proposes to expand the conception of a work to include notation and preservation as integral and ongoing processes, continuously reperformed as part of the labor of creation.

As mentioned previously, this research is in its early stages and is currently in development through a practice-based research approach. *mutable experiment*, as well as new mutable scores, will undergo continuous iteration, being adapted to different instruments and forms. Eventually, all scores and other materials will be published as an open-source project and made available to composers or musicians who wish to interpret, adapt, or transform the work.

[6] Donin gives the example of Beethoven's notes in the margins of his scores or the collections of his sketches.

[7] See Software Evolution by Kim et al. [11].

[8] Multiple types of software licensing strategies (such as copyleft practices) could help composers maintain their desired level of control over their work.

A preliminary step will be to adopt a system to organize, preserve, and make the material accessible. As discussed above, multiple solutions intended for software development could be used. An iteration hierarchization system must be developed to determine when a modification constitutes an adaptation and when it represents a divergence substantial enough to warrant a separate branch. Likewise, the specific materials required for each individual iteration have yet to be determined. Furthermore, questions of authorship and ownership will have to be addressed, although open-source software practices, as mentioned, may offer solutions. These questions will become clearer over time, particularly if community engagement allows the project's methodology to evolve in tandem with the works themselves.

Finally, an artistic presentation of a mutable score should be conceived to communicate the principles and ambitions of the approach. Rather than performing only the most recent iteration, the exposition should make the score's evolution and multiple versions clearly apprehensible, allowing the audience to experience the process of adaptation and divergence. This could take the form of consecutive performances of different iterations and include an alternative format, such as a sound installation, that emphasizes the work's iterative and evolving nature.

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