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Post-digital Aesthetics in Contemporary Music Performance: Morphing and Hybridisation in Morphing Spaces: The In-Between Projections, a Co-creation for Tenor Saxophone and Multimedia

Post-digital aesthetics are increasingly evident across a wide range of contemporary artistic practices, questioning the nature of socio-technological relationships. In contemporary music composition and performance, this aesthetic challenges the creation of new performative practices and explores the hybridisation of the digital and physical/material domains, placing composers and performers/instrumentalists before a broad spectrum of expressive, creative, and technical resources enabled by technological mediation. This article examines the co-creation processes involved in developing a work for saxophone and multimedia during an artistic residency that brought together a composer, a saxophonist, and various technological resources. Adopting a case-study methodology, it focuses on the performer's role as a vehicle for integrating the digital/technological and physical/instrumental dimensions through experimentation and research. The study demonstrates how the hybridisation and morphing of domains can productively support musical creation and how these concepts contribute to instrumental advancement, both in relation to the instrument itself and to performance practice. Acknowledging surrounding artistic heterogeneity, the creative and performative work described raises new questions for the artistic researcher, encouraging reflection on their role in relation to evolving modes of musical consumption and positioning them within a co-creative space essential to the generation of the work's aesthetic material, whether sonic or visual.

1 Introduction

We live in a moment of technological ubiquity: technology has come to affect everyone in some way, to the extent that it is perceived “only by its absence” (Negroponte 1998, 1). Digital technologies, and their development and democratisation throughout the twentieth century, have profoundly transformed how music is listened to, analysed, and performed (Chion 1997, Katz 2010). The advent of the twenty-first century has not entailed a reduction in technological use; rather, it has given rise to a “blended environment where the physical and digital worlds interact in vibrant and interdependent ways” (Caires 2025, 10). It is within these interactions that the post-digital aesthetic (Cascone 2000) emerges, initially developed by self-taught composers in the 1990s and grounded in the perceived errors and “failures” of digital technologies (Andrews 2002).

A subject of reflection, mutation, and debate throughout the twenty-first century, the post-digital aesthetic manifests across multiple levels: 1) an intention to employ technology creatively and critically, giving rise to artistic methodologies that “blur the established dichotomies between new and old media, between online and offline, and between

digital and physical” through the deconstruction, or hacking, of technological processes, thereby revealing their mechanisms and demonstrating the “sociocultural effects of their omnipresence” (Ferreira and Ribas 2020, 121); 2) digital technology is not regarded merely as a neutral tool, but as imbued with cultural implications (Manovich 2002, Schubert 2021); 3) new modes of engaging with technology, with “post” understood not as a break but as a transformation, move towards an aesthetic that critically reflects on the implications of the surrounding digital culture (Ferreira and Ribas 2020, Cramer 2014). Although attempts to define the post-digital concept since 2018 have proven largely unproductive and challenging, as its definition has expanded in multiple directions (Jandrić 2023, Jandrić and Knox 2021), today, the post-digital constitutes an important¹ conceptual and theoretical framework, as well as an aesthetic that provides a broad philosophical and artistic perspective. It is applied primarily within music and design (Escaño 2023), where it enables a critical engagement with the contemporary artistic world (Macgilchrist 2023), while also capturing “the messy, entangled and unpredictable nature of the socio-technical relationships (Jandrić and Knox 2021, 784).²

In Western contemporary music, features such as “hybridity,³ rematerialisation, multisensory experiences, and active involvement” (Caires 2025, 11) have given rise to new performative practices, which use musical systems in unconventional ways and allow composers to incorporate “new technology, material properties, visual media (...), and other elements as compositional material” (Magnusson 2018). Therefore, instrumental performers face significant challenges. Classically trained musicians, still rooted in a score-based performance context (Kharatyan 2024), experience a shift in their role and relationship with the composer (Budai 2014) and must integrate embodied technical knowledge acquired in academic settings with other skills (Stene 2015), including the use of digital tools and the incorporation of additional performative dimensions, such as bodily movement and gesture.⁴ New artistic practices, including multimedia composition, Social Composing⁵ (Muntendorf 2015), and New Discipline⁶ (Walshe 2017), as well as the work of composers such as Stefan Prins, Michael Beil, João C. Pinto, Carlos Perales, Igor C. Silva, Ted Moore, Oscar Escudero, and Alexander Schubert, exemplify creative approaches at the intersection of technology and ar-

1. This is evidenced by the recent award of a significant grant from the Swiss National Science Foundation (SNSF) to the project “Postdigital Musicking: Studies on the ‘multimodal shift’ in the practice of contemporary art music in Western Europe” for the period 2024–2028 (see <https://data.snf.ch/grants/grant/10000554>).

2. “Today the postdigital is hegemonic, and as such is entangled with everyday life and experience in a highly complex, messy and difficult to untangle way” (Berry 2015, 50).

3. “The root of hybridity in the New Aesthetics is key to the postdigital” (Causey 2016, 431).

4. “The musician’s moving, dancing, touching, speaking, singing, shouting, grimacing, sounding body opens a novel and still expanding palette of expression – but its use also requires new skills that are currently not an explicit part of higher musical education or standard musical performance practice” (Borregaard 2023).

5. “Social Composing is based on the intention of mediating through music and intermediacy—that is, radically placing the communicative ability of music in the center, to be able to trigger resonances in all those living in the virtuality-reality continuum” (Muntendorf 2015).

6. “... music in which the physical, visual, and theatrical are as important as the sonic.” (Walshe 2017).

tistic creation within a post-digital context (Campos 2022). On the other hand, performers such as Zubin Kanga and Stephane Ginsburgh,⁷ Jennifer Torrence,⁸ Pedro Pablo Cámara Toldos (2024), Mark Knoop, Sarah Albu, Winnie Huang,⁹ Thomas Moore, and Sebastian Berweck place artistic and/or academic emphasis on instrumental performance,¹⁰ which may require “work-specific technical practices”¹¹ (Stene 2015). These performance areas remain relatively underexplored for three main reasons: 1) the heterogeneity of the works, which precludes homogeneous or universal approaches; 2) the anachronism between the acquisition of instrumental techniques and contemporary performance practices; and 3) the ongoing pursuit by performers and composers to deliberately challenge “idiomatic ideals in search of new expressive means by transgressing technical conventions” (Stene 2015).

Within this context, this article examines the artistic processes behind a co-creation between a performer–saxophonist and a composer: *Morphing Spaces: The In-Between Projections*. It seeks to articulate: 1) the creative and artistic decisions informed by the trajectories and technical expertise of both authors; 2) how these decisions shaped the conception and performance of the resulting musical work, identifying key aspects of the digital–physical hybridisation aesthetic and *morphing*,¹² as well as their narrative and acoustic implications; and 3) how these processes function as catalysts, both for the technical and aesthetic roles of the musicians and for the ways in which technology-based creation can continue to support the development of the instrument (as a device) as well as of the instrumental performer, situating the latter within a contemporary transdisciplinary artistic domain.

Paulo de Assis (2023, 55) poses the following questions: “How can music be rethought in the digital age? How can creative musical practices be developed in response to the conditions and affordances of contemporary society? What is the role and function of the musician in contemporary society?” In response, this article seeks to advance the discussion within the post-digital aesthetic in the domain of Western contemporary music rooted in the classical tradition. It does so by illustrating: 1) how the hybridisation of domains can serve musical expressivity; 2) how concepts and practices originating in technological contexts, such as *morphing*, employed here in a non-orthodox manner, may be recontextualised within musical creation; 3) how the instru-

7. As pianists and performers, they contextualise the difficulties, specificities, and performative decisions involved in preparing and performing *Piano Hero #1-4* by Stefan Prins, *_derivations_* by Benjamin Carey, and *v* by Patrick Nunn (Ginsburgh 2019, Kanga 2017).

8. Through reflections arising from the creation and performance of *etudes to become a deer* and *What Noises Remain* (Torrence 2018).

9. The author places the performer’s body, gesture, and visibility at the centre of the analysis, examining notational and performative characteristics across several case studies, and identifying possible pathways for future creation and performance (Huang 2022).

10. Also noteworthy are the advances enabled by the concept of active performance in relation to mixed music (Furniss 2017, Portovedo 2019), and by post-instrumental practice with regard to some contemporary multidisciplinary repertoire (Devenish 2021, Moore and Verlaak 2025).

11. “The technical skills required by such compositions cannot be reduced to common, general exercises practiced separately in order to support one’s fundamental ability to perform them” (Stene 2015).

12. A definition can be found in Section 3.1.

mentalist and the composer continue to assume a fundamental role as creative agents despite an increasingly autonomous technological environment; and 4) how experimental processes, including the development of work-specific techniques and iterative trial-and-error practices, can lead to unexpected yet artistically significant outcomes within our artistic practice.

2 Methods and Methodology

Within a methodological framework enabled by artistic research, the focus is on two fundamental premises: experimentation and collaborative creation. Experimentation is a key factor in generating new knowledge (Burke and Onsmann 2017, Rink 2016), as evidenced here through sonic exploration processes involving the instrument (saxophone) and technological models or patches. The artistic researcher examines their artistic, creative, and performative decisions, attributing to them transferability, reliability, and purpose. This includes documenting the process from initial intention, through encountered challenges, to a perspective that integrates both technical and aesthetic aspects.

This co-creation emerged from a three-week artistic residency, structured around daily sessions of experimentation and dialogue between the saxophonist and composer. The work centred on the tenor saxophone in interaction with computer-based systems, microphones, and loudspeakers. Digital tools, including Max/MSP and TouchDesigner, were selected in accordance with the authors' technical expertise and prior experience. Audio recordings in Reaper documented the range of extended instrumental techniques explored, such as multiphonics, air sounds, *closure in series*, *growling*, *glissando*, *slap*, and key clicks. These explorations were informed both by the saxophonist's established practice and by relevant literature in the field. In parallel, a written sketchbook was maintained to register techniques that proved particularly effective in sonic interaction, supporting later stages of reflection on the work's potential development. The collected material was analysed qualitatively and further enriched through ongoing critical exchange between the collaborators.

Collaborative creation between composer and performer simultaneously repositions the creative paradigm within the role of the instrumentalist (Cook 2013, Emmerson 2017) and enables the mobilization of creative resources that would not be attainable through individual practice alone (Hooper 2017, Yamamoto and Miyake 2003). Collaboration has been receiving increasing attention within the field of Western classical music (Sawyer 2007), with a growing body of research examining how composer-performer interactions unfold and identifying a range of collaborative models and approaches. For instance, Vera John-Steiner (2000) outlined specific collaboration patterns, Hayden and Windsor (2007) proposed distinct categories, and Taylor (2017) distinguished forms of working relationships based on decision-making hierarchies and divisions of labour. In this case, however, the aim was not to rep-

licate or iterate upon these established models. Instead, they served as points of reference, informing a flexible and open approach to collaboration in which hierarchical roles were deliberately set aside. This process demonstrates how the experiences of performer and composer, creative decision-making, and technological integration co-evolve. The perspective of the instrumentalist-saxophonist was incorporated to explore: 1) the study and analysis of the scores; 2) how previously acquired skills intersect with and are adapted to the new skills required for this work; and 3) the ways in which these unique collaborative dynamics resonate with potential future performative approaches within this specific case study.¹³

3 *Morphing Spaces: The In-Between Projections, for Tenor Saxophone and Multimedia*

As mentioned, in this process, we positioned ourselves within a performer–saxophonist and composer collaboration, characterised by a highly idiosyncratic workflow and outcome. Based on prior knowledge of the composer’s aesthetic, an essential aspect of the instrumentalist’s performative approach and the final artistic outcome (Kanga 2021), the collaboration is shaped by the composer’s dual contributions: expertise in developing and operating software and hardware, as well as a commitment to collaborative engagement.¹⁴ Previous compositions¹⁵ reveal an aesthetic that places equal emphasis on the musical instrument (its idiosyncrasies, extended techniques, and timbre) and on electronics or multimedia, reflecting the inter- or transdisciplinary context inherent to contemporary post-digital culture (Pereira and Adérito 2020). Through a combination of collaborative work within a laboratory context of experimentation and residency, and the intrinsic motivations of the performer and composer,¹⁶ we explore the concept of *morphing* across two dimensions. This concept serves as the inspiration for both the experimental processes and the sonic textures that shape our work.¹⁷

3.1 *Morphing: Digital-Physical Hybridisation*

Although the concept lacks a consensual definition (Caetano and Rodet 2010), we focus here on sound morphing, understood as “apply-

13. This method allows a versatile approach and the collection and analysis of data from various sources (Benbasat, Goldstein, and Mead 1987).

14. The openness demonstrated by the composer should not be underestimated. The issues encountered, as well as the practices developed and refined throughout a long-term collaboration, should be acknowledged and shared by both performer and composer alike.

15. For further musical content: <https://soundcloud.com/fran-collado-548849709>

16. We consider the background of each agent as highly influential in shaping artistic choices and motivations. As Travasso (2025, 156) notes, “the artist’s background is the starting point for a project. While the instrumentalist starts from a score, working within boundaries between musical knowledge and skills”. This also highlights the fragility or limitations often experienced by classically trained instrumental performers within the context of Western contemporary music.

17. “The development of personal tools and the value of starting-from-scratch are important characteristics” of the post-digital (Ferguson and Brown 2016, 129).

ing gradual transformation from one sound as the departure to another sound as the destination” (Bökesoy 2013, 1), while also paying close attention to the intermediate spaces encompassed within this journey (Zope and Zope 2017). Being a concept applied within musical composition and recognised as an exciting creative space (Caetano and Rodet 2010), we sought to apply sound morphing as an element of hybridisation between digital/electronic and physical/instrumental media. This hybridisation resonates with us, as the deep permeation of the digital into our lives affects not only musical creation but also the very “representation and reception” of music in the post-digital context (Schubert 2021). It aligns with a creative use of technology that fosters the development of “artistic methodologies that blur established dichotomies between old and new media, (...) digital and physical realms” (Ferreira and Ribas 2020, 121). This is precisely what we aim for in *Morphing Spaces: The In-Between Projections*: the hybridisation and the rejection of dichotomy between the physical and electronic realms across two domains.

Electronics-Instrument Hybridisation

In the realm of electronics, we aim to achieve sonic transitions through a range of AI models, ultimately leading to the use of a RAVE model¹⁸ implemented within Max/MSP¹⁹ patches. Four independent RAVE models were trained on distinct corpora of recorded tenor saxophone sounds: one comprising a range of sounds from Bb3²⁰ (the instrument’s lowest note); another comprising instrumental techniques; a third based on the multiphonics employed in the piece; and a fourth exploring *closures in series sequences*. Each dataset was curated as a training corpus and used to train a dedicated RAVE model. Once trained, these models are used in a deferred-time context through exploration of their learned latent spaces. By adjusting their parameters, it becomes possible to navigate and control intermediate sound spaces in real-time (see Fig. 1). The resulting sounds and transformations are subsequently integrated into the composition as fixed electronics.

In addition, the models are also deployed in live performance:²¹ the saxophone signal functions as the system’s input, which the model encodes and decodes in real-time according to the sonic domain learned during training. The parameters of the *nn~* object are adjusted in real time, thereby shaping the decoding process and generating different sonic outcomes within the electronic layer. In this way, subtle variations derived from the saxophone sound emerge, unfolding in parallel with – and along an alternative trajectory to – those of the performer.

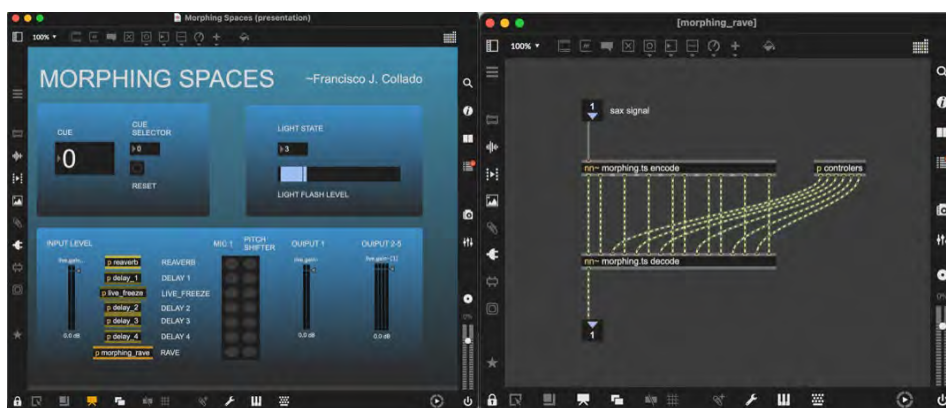
18. RAVE (Realtime Audio Variational autoencoder) is a deep learning-based system capable of “learning” musical dimensions directly from audio data presentations. They are commonly employed in the context of live music performance and offer improvements “for fast and high-quality neural audio synthesis” (Caillon and Esling 2021). Their main applications include timbral transformations and real-time audio manipulation (Carvalho et al. 2024).

19. <https://cyclring74.com>

20. Corresponding to concert pitch Ab2.

21. RAVE can be exported in streaming mode for real-time use within the *nn~* object, in environments such as Max/MSP or Pure Data.

Fig. 1. Screenshot: Max/MSP patch from *Morphing Spaces: The In-Between Projections*, employing the *nn~* object in Max/MSP.²²



These intermediate sound spaces are reflected through the capabilities of the tenor saxophone and the skills of the performer, who employs instrumental techniques such as vocal sounds²³ and *growling* (singing while playing), aeolian and air sounds²⁴ (with and without the mouthpiece), multiphonics, *flutter tonguing*, and *closure in series* (Capellino and Posadas 2018). After our experimentation, these instrumental techniques have demonstrated a strong capacity to integrate the performer and their instrument into the electronic aesthetic (considering texture, timbral gestures, and chromatic nuances of sound) thereby contributing to the intended condition of digital/physical symbiosis.

As a demonstrative example of the subjective pursuit of this mirroring, we propose listening to a sound produced solely by the saxophonist, based on air sounds generated by blowing over the saxophone neck (without the mouthpiece), which can be accessed here as Audio Excerpt 1 via the link in the caption of Fig. 2. By employing such air sounds, we aim to incorporate and establish a mimetic relationship with the electronic sounds generated and audible at the beginning of the piece (Audio Excerpt 2 accessible via the same link). This integration is also evident in the use of vocal sounds (singing while playing), where the buzzing created by the interaction between voice and instrumental sound facilitates a smoother, more organic transition and strengthens the connection with the electronic layer (Audio Excerpt 3 accessible via the same link).



Fig. 2. Sound Recordings:
(<https://osf.io/v849t/>).

Visual Projection-Performer Visuality Hybridisation

Similarly, in the visual domain, alongside the sonic, we explore the idea of physical-digital hybridisation through the use of technology. As in the sonic context, the performer's visual presence is integrated into

22. “nn~ is a Max/MSP and PureData external for AI audio processing. It enables to easily explore deep latent spaces and play with audio streams they generate” (Scurto and Postel 2023). Free access through https://github.com/acids-ircam/nn_tilde

23. For example, one can “sing while playing the saxophone”, producing a kind of “buzzing in the throat and head area” (Weiss and Netti 2010, 178). By using our voice, over which we generally have natural and significant control, this approach facilitates the emergence of transitions in a gradual and organic manner.

24. “Ever since noises have been intentionally employed as musical material (see, e.g., John Cage), pure air or blowing noise has, in fact, become a typical sound material in “new music”. Air sounds can be produced in the most varied ways and in all registers of the saxophone”. (Weiss and Netti 2010, 157).

the morphing process, this time directly within the image²⁵ itself. To realise this creative and aesthetic process we used the software TouchDesigner,²⁶ drawing on the AI-based system Stream Diffusion.²⁷

As shown in Fig. 3, a projection of the performer's image, captured using an Xbox Kinect in infrared mode, is subjected to continuous transformation. Before entering StreamDiffusionTD within TouchDesigner, the signal passes through several image-processing operators (TOPs): first, *Threshold* enhances the separation between the figure and the background; then, *Edge* emphasises its contours. From this processed image, StreamDiffusionTD generates further visual transformations.²⁸ This technology was employed for three main reasons, considering that our interest as artists is purely aesthetic and creative: first, it offers user-friendly implementation; second, it enables interaction and creative control through text-based instructions, known as prompts;²⁹ and third, it is open-source.

Fig. 3. Screenshot: TouchDesigner implemented for *Morphing Spaces: The In-Between Projections*; specifically showing the image transformation generated through StreamDiffusionTD tool.



Through this approach, we integrate the performer's visuality as both an aesthetic and creative resource, positioning it as a generator of ambiguity for the audience, grounded in the "decoupling of original and image, as well as cause and effect" (Schubert 2021, 13) that so strongly characterises the post-digital condition we inhabit. At the same time, this expands the performative space and the range of resources available to the solo artist (Kanga and Schubert 2016). While it does not

25. Morphing may be applied not only to sound but also to the visual domain. As Zope and Zope (2017, 81) notes, "Morphing is defined as a process which changes the one image into other through seamless transition. Thus, it is the fluid visual transformation of one image into another image using the sequence of intermediate images".

26. <https://derivative.ca> "TouchDesigner is a software that allows us to build very efficient tools for real-time video processing, 3D rendering, procedural visual work, multi-touch interfaces, and much more in a very easy visual way" (Lechner 2014, 327).

27. "StreamDiffusion is an innovative diffusion pipeline designed for real-time interactive generation. It introduces significant performance enhancements to current diffusion-based image generation techniques" (cumulo-autumn n.d.).

28. During the concert, these parameters are adjusted in real time using a controller. At the premiere, the manipulation focused primarily on *Step* and *Seed*. The *Step* parameter determines the degree of image transformation: at low values, the result is more free-form and fluid; at high values, the image retains more of the original source's features. The *Seed* parameter, meanwhile, defines the random basis of the visual generation: when kept fixed, the result is more stable; when varied, new configurations emerge.

29. Since the prompt used was "abstract", each variation of *Seed* produced images that were very different from one another. The morphing effect was generated primarily by continuously modifying the *Step* value while the *Seed* remained fixed, allowing the image to transition progressively between visual states. When a new *Seed* was introduced, this change was made with high *Step* values, as this resulted in a smoother and more fluid transition to the new configuration. Later, upon reducing *Step* again, the image returned to a more free-form and variable behaviour, but always in a continuous manner.

directly affect the sonic behaviour of the performer, beyond requiring them to avoid overly rapid physical movements and to remain within the area captured by the sensor, the visual projection and the immersive environment created through the use of LED projectors contribute to a more enveloping experience (see Fig. 4). This results in a heightened sense of ambiguity and subjectivity,³⁰ aligning with the nature of multi-media or transdisciplinary artistic creations.

We do not seek to establish or propose universal uses of technology, as technological tools such as stable diffusion³¹ models offer infinite creative possibilities. Within our collaboration, we present one such possibility while deliberately avoiding any claim to universal applicability.

Fig. 4. Premiere of *Morphing Spaces: The In-Between Projections*.



3.2 Score and Performance

The collaborative process between saxophonist and composer is fundamentally driven by experimentation. Starting from the creative motivation described above, we proceeded to experiment with multiphonics.³² Drawing upon key reference materials on this technique (Kientzy 1982, Weiss and Netti 2010, Capellino and Posadas 2018, Michat and Venturi 2010), we focused on tenor saxophone multiphonics that were: 1) feasible within saxophonist's practice, albeit challenging to execute; 2) capable of producing a relatively soft sound in the middle register; and 3) amenable to transformations within the multiphonic itself.³³ This resulted in the selection of three distinct multiphonic clusters, produced using the same fingering, with achievable transitions between states as indicated by the arrows in Fig. 5. When working with multiphonic clusters, it is essential to recognise that certain dynamics

30. Although disparate, by intrinsic comparison, auditory perception and visual perception influence each other, "lending each other their respective properties by contamination and projection" (Chion 1994, 9).

31. Technology released in 2022.

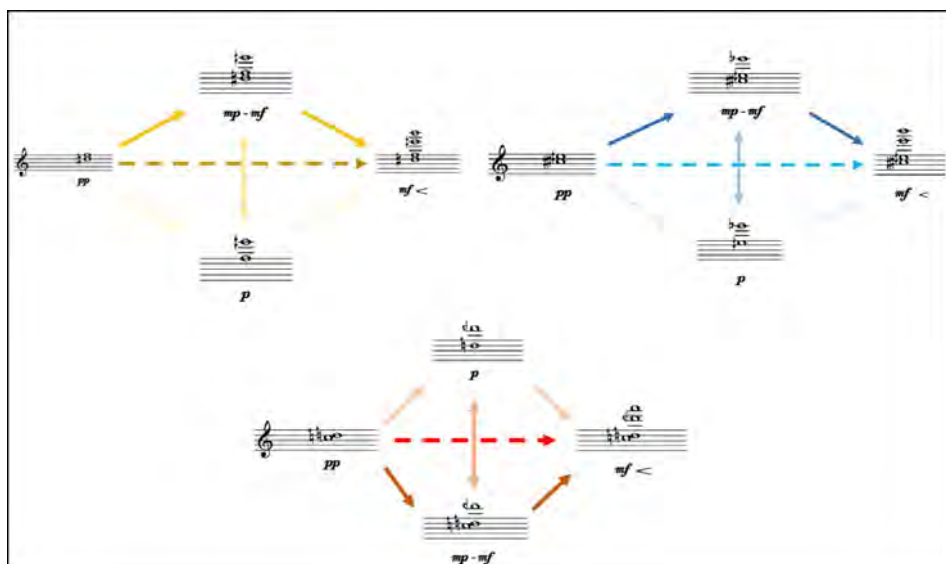
32. "Multiphonics consist of the production of several notes at once by otherwise monophonic instruments" (Riera et al. 2014, 1).

33. As an example of the internal transformation of the multiphonic, we can listen to Audio Excerpt 4, accessible via the link in the caption of Fig. 2.

complicate transitions both within a single cluster and between different clusters.

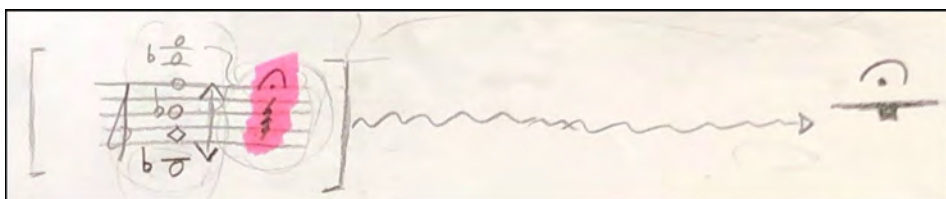
This work proved to be highly fruitful, as it allowed the discovery of multiphonic states not documented in the reference materials consulted. Such discoveries typically arise during experimentation when the performer is actively involved, since in the performer's absence, the composer would rely solely on the listed sources as compositional resources, thereby limiting the expansion of the sonic material.

Fig. 5. As a result of the experimentation, the continuous arrows indicate the feasible transition pathways from the initial stage of the multiphonics to their final state. The dashed arrow represents a direct transition between these states, which is not readily achievable in instrumental performance.



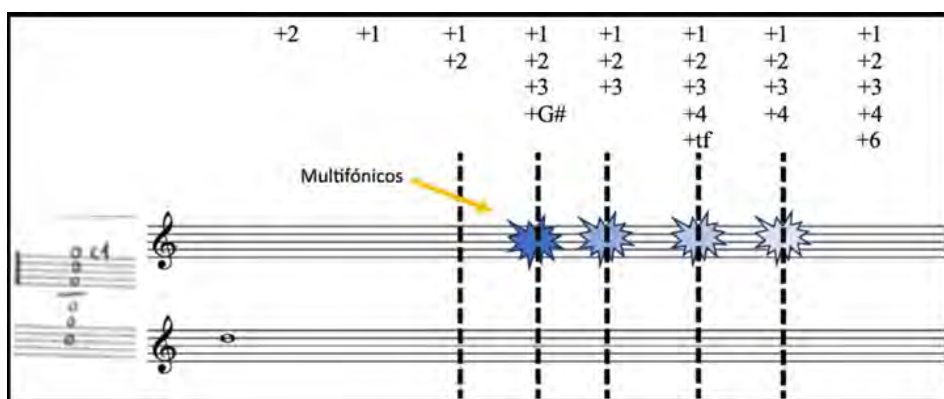
As mentioned, other resources explored and experimented with include vocal sounds (singing while playing) and *closure in series* (Capellino and Posadas 2018). In the case of vocal sounds, these were approached and developed as an effective vehicle for morphing from one sound to another (as noted on the previous page), particularly emphasising the intermediate spaces, as illustrated in Fig. 6.

Fig. 6. Excerpt from the score of *Morphing Spaces: The In-Between Projections*, illustrating the use of the voice as a resource for sonic transitions.



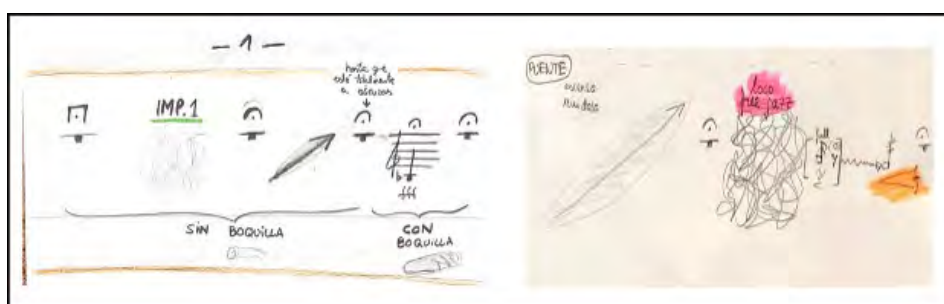
In the case of *closure in series*, our approach involved experimenting with their function in the given context, familiarising ourselves with them, and establishing a parallel with multiphonics by generating multiphonic sounds from specific fingerings associated with *closure in series*. An example is shown in Fig. 7.

Fig. 7. Through experimentation, when performing the descending *closure in series* sequence starting from the medium D³⁴ (using the c1 key fingering), we were able to obtain multiphonics at four distinct positions.



As shown in Fig. 8, part of this work involves improvisation based on specific instructions, namely: improvisation without the mouthpiece, focusing on air sounds and articulation using only the saxophone neck, previously explored with the electronics; improvisation on particular *closure in series*; and “wild” improvisation, characterised by high dynamics, an altissimo register, and very rapid, harsh movements.

Fig. 8. Excerpt from the score of *Morphing Spaces: The In-Between Projections*: improvisation proposals.



Beyond the sections in which improvisation is proposed, the score provides indications of the musical gestures and resources to be employed, such as multiphonic clusters and specific *closure in series*, while leaving the duration of each event open. This results in a markedly open work, granting the performer a substantial degree of co-authorship through their influence on the unfolding of the piece itself. Such an approach aligns with Kanga’s (2021) view that a performer’s realisation is not strictly the composer’s work, but rather a reflection of the performer’s interpretation of the composer’s aesthetic.

3.3 Challenges and Future Performances

We do not intend to present *Morphing Spaces: The In-Between Projections* as a definitive artistic product; rather, the work remains in constant development, with each performance constituting a further step within a broader artistic process (Diegert 2018). Looking ahead, several challenges emerge. Firstly, it must be considered that the performative and technical/technological nature of the work conditions the processes of iteration and dissemination. To date, the piece has been performed pub-

34. D5 for B-flat tenor saxophone (written pitch), corresponding to concert pitch C4.

licly on two occasions,³⁵ with both the performer and composer present in each instance. Consequently, the composer operated the Max/MSP patch, the TouchDesigner node network, and the LED lighting system from the computer, while the performer focused solely on the instrumental performance. To support wider iteration and dissemination, the Max/MSP patch should be streamlined to provide full performer control on stage, while the TouchDesigner node network and lighting system require reorganization to allow for increased automation during performance.³⁶

Secondly, there are logistical concerns. The current setup requires transporting visual resources, including eight LED lights, an Xbox Kinect sensor, and two computers (a MacBook Pro computer and a Windows PC). It is also designed for quadriphonic sound, in addition to the standard video projector and PA system typically available at performance venues. However, few of these resources (including the quadriphonic setup) are available at most accessible venues. Consequently, there is a need to enhance the work's "accessibility" by simplifying the materials for transport and reducing technical complexity. To this end, new versions of the work are being developed, featuring a reduced number of LEDs, the integration of TouchDesigner and the Max/MSP patch on a single computer (despite the associated technological risks), adaptation of the patch for performer control via MIDI pedals, and modifying the sound for stereo output.

4 Final Considerations

In a post-digital context, where technology in music is more than just a tool, actively influencing the entire artistic process, the use of creative and performative resources, such as morphing or the blurring of digital and physical domains, proves highly fruitful for musical creation and experimentation.

In *Morphing Spaces: The In-Between Projections*, the post-digital aim of merging the digital/technological and physical/instrumental dimensions requires mastery of a range of instrumental techniques, previously explored in a familiar experimental context (such as multiphonics or *closure in series*). These techniques must be executed at varying speeds and with a level of familiarity that allows for a fluid and expressive musical discourse. For a performer trained within the Western classical tradition on an instrument like the saxophone, this often involves a process of relearning, as such techniques are rarely addressed in the standard repertoire, appearing only in specific works and proving difficult to sustain consistently in daily practice. At the same time, the saxophone's

35. D5 for B-flat tenor saxophone (written pitch), corresponding to concert pitch C4.

36. This aspect assumes particular importance, as Pennycook (2008, 207) notes: "As composers, we expect other performers to repeat our works anticipating future performances by unknown performers through the traditional modes of music publishing and word of mouth dissemination". Nevertheless, in practical terms, "the vast majority of these kinds of pieces few performances have occurred without the presence of the composer", which underscores composers' concerns and necessitates that performers "time performers will need to acquire some basic technical know-how" (Pennycook 2008, 207).

technical scope is extended through the development of previously undocumented multiphonic states, achieved through the authors' creative input, their respective background, and an experimental practice-based approach carried out in situ.

From a holistic perspective, we seek to describe the saxophonist's involvement and significance within the creation and performance of *Morphing Spaces: The In-Between Projections*. We point, for instance, to the possibility of an instrumentalist who, despite years of highly structured and traditional training, engages with the present moment in an open and exploratory manner, embracing new possibilities and stepping beyond their comfort zone. In this work, the saxophonist performs within contexts that require interaction with electronic devices and software(s), where sound, body, and movement become integral components of the performative act. The performer assumes an active role (de Assis 2018) in the co-creation process and in subsequent performative and technical decisions, developing both creative and technical skills in improvisation and thereby expanding their overall artistic capacity, while proposing and fostering, in both creation and performance, the use and adaptation of methods and materials in the development of new musical works, often leading to site- or performer-specific pieces, without aiming for procedural or performative generalisations.

This work also highlights several emerging conceptual issues and directions for future research. Performers are now confronted with notions such as co-creativity between human and non-human creative agents, reflecting an evolution from systems with limited responsiveness to forms of performance that challenge traditional ideas of authorship, agency, and creativity. Contemporary technologies significantly expand the possibilities for live performance; however, the instrumentalist – who continues to operate through embodied and technical means – may find their sonic repertoire, creativity, and capacity for innovation, as well as their “sonic identity”, increasingly questioned and reconfigured. The challenge today lies in approaching the machine as an interlocutor (Rowe 2001) – an entity whose sonic decisions unfold in real time – rather than perceiving it merely as an extension or augmentation of the instrumentalist. At the same time, working with machine learning models introduces tensions between technical complexity and performative accessibility. These developments also call for critical reflection on the environmental and logistical conditions of contemporary artistic production.

By articulating these processes, the performer/instrumentalist is positioned in relation to the questions posed by Paulo de Assis in the previous section,³⁷ acknowledging that we are still “only starting to grasp” the “new modes of expression” (de Assis 2023, 56) made possible by digital art and technology. Ongoing challenges, such as negotiating a balance between technological innovation, the material and environmental consequences of digital tools, and the preservation of meaningful aesthetic experience and cultural integrity (Caires 2025), continue to engage

37. See the Introduction.

the contemporary artist's attention. The hybridisation of the human and physical domain with what is commonly understood as the digital or technological domain is not only a condition of everyday life but also a driving force behind unique, often unrepeatable and context-dependent forms of artistic creation; this outcome further aligns the performer-instrumentalist with evolving modes of musical consumption that have undergone significant transformation in recent years (Onderdijk et al. 2023).

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