# Networked performance as a space for collective creation and student engagement

Hans Kretz

Department of Music, Stanford University
kretz@stanford.edu

**Abstract.** This article takes a practice-based approach to exploring the specific issues and problems of distributed networked performance, in the light of the various aesthetic categories directly affected by this practice. It considers how traditional categories of aesthetics, such as the notion of presence, are called into question by the virtualisation of sonic space. Distributed performance also casts the notion of space in music in a new light. Another essential contribution of online practice is that it allows participants to decentre the question of auctoriality – or authorship – as it is anchored in a metaphysics of presence.

**Keywords:** #Networked performance #Aesthetics of distributed performance #Philosophy of technology.

## 1      Introduction

This article takes as its starting point my experiences working with the Stanford New Ensemble (henceforth SNE) over the period 2020–21, as global circumstances pushed us to transition from in-person to online rehearsing and performing. This shift was accomplished thanks to the invaluable commitment and energy of the staff at CCRMA (the Center for Computer Research in Music and Acoustics at Stanford University, led by Chris Chafe), who made it possible for us performers to maintain our musical activities under the best possible online conditions. In the course of growing familiar with JackTrip – a software developed by Chris Chafe and Juan Pablo Caceres at CCRMA for high-quality, uncompressed audio in networked performance – the ensemble participants and I were able to develop our understanding of the particulars of online music-making, on both a musical and an aesthetic level. Questions of student engagement and of community-making in this particular context were also critical to us. The article presents some of the outcomes of this reflective thought as it emerged through and beyond my and our engagement in network performance.

I begin by discussing the necessity for an explicit aesthetic investigation into distributed performance, some of its particular problematics and stakes, and seek to show how this practice provides an opportunity to reassess and reevaluate some of the traditional questions of aesthetics. But the scope of networked performance extends beyond a reflection confined to the sphere of musical practice. Indeed, questioning the nature of the phenomena that occur in a virtual acoustic space calls for a rethinking of

certain assumptions in the light of the philosophy of mind. I explore in detail the implications for both thought and practice of the accentuation of musical space, a notion that in recent practice gains an unprecedented autonomy. I also consider how the knowledge gained through these contemplations can lead us to rethink the notion of the work of art as well as that of the musical object, and possibly the technical object – that is to say, the question of the modes of existence of works as well as of technical objects. All these elements culminate in the question of the work considered natively as an object that expresses itself online, in a plural way, namely as a collective creation that renews student commitment. I end by taking up again the notion of space, now understood as the public space of both music-making and philosophical discussion, and consider the potential for an 'ethics of discussion' seen through the lens of technological artefacts.

## 2      The aesthetics of networked performance

The literature devoted to distributed performance has blossomed over the past twenty years. A significant number of these publications have, unsurprisingly, been primarily concerned with technical questions as to the ways in which real-time interactions could be achieved, starting with video telephone with images updating every five seconds in the 1990s and, with the more recent development of JackTrip, achieving near-zero or ultra-low latency. If publications from the early 2000s such as Craig Saper's *Networked Art* and Anna Munster and Geert Lovink's 'Theses on Distributed Aesthetics' began to engage with the challenge posed by distributed performance to the very nature of artworks, it nonetheless remains common for performers to consider online performance, however high the quality, as always a substitute: the ideal scenario is presumed always to be on-site presence shared with audience members.

Since 2019, the *Journal of Network Music and Arts*, a peer-reviewed open-access digital research journal published by Stony Brook University, has been offering a transdisciplinary approach to a diversity of questions raised by network performance, beyond the already existing literature of technological import. The questions addressed involve network arts technologies such as JackTrip, LoLa (a low-latency, high-quality audio/video transmission system for network musical performances and interaction), virtual reality, OBS Studio (OBS = Open Broadcaster Software) and other software. The journal also engages with thematic approaches, among which aesthetic issues have begun to find their place. For example, the latest issue focused on the notion of 'distance' and its transformations, whether 'physical, emotional, societal, environmental [or] dimensional'.[1]

In addition to the innovations and technological developments in networked performance since the beginning of the pandemic, this performance practice has thus lent itself to the emergence of a vast corpus of research questions. This context calls for the progress of a philosophical and aesthetic inquiry that could potentially inform performers, researchers and technologists – a perspective I would compare to Hubert

L. Dreyfus' phenomenology-based approach to technology in his critique of Artificial Intelligence, which led to an enhanced dialogue between philosophers and AI engineers that culminated in technological developments founded precisely upon the results of this dialogue.

In particular, I believe that thinking about networked performance can lead to a reframing of traditional questions in aesthetics. Such common notions as the concept of presence, from Plato to Derrida through Heidegger, need to be rearticulated or reinvestigated in the light of the notion of *telepresence*, which has assumed such critical importance since the development of VR and augmented reality in the arts. Jack Loomis's 1992 article 'Distal Attribution and Presence' is foundational here, as is Stephen Jones's 'Towards a Philosophy of Virtual Reality'; a more recent publication of primary interest focuses on the UnStumm | Augmented Voyage mobile app and server infrastructure, an artistic vehicle for the realization of telematic live performances (video art, music, and dance in augmented reality).[2] If, traditionally, the notion of presence in art has been linked to that of truth, the ontology of the work of art must question the way telepresence challenges its fundamental assumptions.

## 3 From aesthetics to philosophy of mind

Because of the focus on technical aspects, there was a lack of development of aesthetic thought in early thinking/writing about networked performance. Thus, an opportunity was missed to renew or reframe canonical aesthetic questions in the context of a performance practice that, by virtue of the communities it serves and reaches out to, paradigmatically associates art and technology. Some of the questions raised by distributed performance, such as the nature and qualities of the virtual sonic space in which the performers 'meet', extend beyond a solely aesthetic inquiry (for example in the notion of presence – *phanesthai* – or telepresence), and touch also upon questions of philosophy of mind. (Are musical mental phenomena internal or external, are they to be found 'within' the mind or are they only real in as much as they are actualised in the public sphere? What if this reality is enacted in a virtual space? Etc.) These are some of the questions that would benefit from being confronted to philosophical approaches other than aesthetics under the paradigm of subject philosophy (a paradigm under whose influence Heidegger remains, even though he seeks to distance himself from it).

## 4 Accentuation of the musical concept of space

One concept that has received recent interdisciplinary attention, bringing together artists and scientists to consider the notion in both its aesthetic and cognitive dimensions, is the question of space. For example, this topic was a focus of discussion in a 2021 event in Aalto University's LASER Talks series (LASER = *Leonardo* Art Science Evening Rendezvous).[3]

Thinking about the concept of space has merits also on a strictly musical level. A number of questions and assumptions of compositional and/or theoretical significance can be profitably reassessed in the light of the experiences to which online jamming exposes participants. One of the most obvious is the question of reconciling improvisation and composition (improvisation in writing, or notions such as musical discourse in improvisation and written music, etc.), since many contexts in which networked performance is produced call for improvisation. Another obvious area of questioning is the concept of space and how musical space can be elaborated compositionally; how it differs from one composer to the next; how different compositional approaches entail a particular relation to the notion of space, compositionally speaking (whether tonal, polytonal, atonal, metatonal, concrete, stochastic, repetitive, etc.). Thus, internet acoustics and audio panning systems could go hand in hand with a reflection of space as an intraspecific category of compositional practice. In that context, it would be particularly interesting to question whether or not the technological means used entail a predetermination of certain aesthetic aspects, or whether the technology employed has no aesthetic qualities, in the same way Langdon Winner in a canonical essay from 1980 investigated whether, beyond mere efficiency, "technical things" (as he calls them) were embodying "specific forms of power and authority".[4] I would like to pursue this reflection by investigating more thoroughly what a reevaluation of space as a musical category, or parameter, entails, both in terms of sonic and acoustic qualities, but also as a notion that appears to be relatively little looked into compared to, say, the notion of time in music.

When referred to the use of technological means that enable ultra-low latency in sharing sound for collective music-making, one cannot fail to wonder whether these tools do not implicitly call for a reevaluation of notions that had previously received little attention. A virtual space whose sonic qualities are not predetermined as they would be in a physical space – i.e. a space whose morphology is dependent upon factors that can be largely acted upon, such as latency, spatialisation of sound sources, panning, reverb, loopback, etc. – underlines the fact that sonic space is as much the result of a deliberate compositional decision as musical figures themselves are the result of a compositional strategy. Different archetypal harmonic patterns or distinctive musical figures, the relations different sounds have with one another in general, convey for each composer a particular image of a sonic space that is dependent on idiomatic syntactical features. The exceptional breadth and diversity of musical approaches to organising sound and material after World War II (from constructivist procedures to indeterminacy, microintervals to a mathematical approach to sonic space (Xenakis), composition using algorithms to metatonality, etc.), concurrent with key developments in electronic music, pushed to the foreground compositional concerns about space and the localisation of a sonic source as an intraspecific component of sound itself, along with pitch, duration, timbre and dynamics. It is of utmost importance at this point in the discussion to make a clear distinction between two different aspects covered by space as a musical phenomenon. As I referred to different styles and composers having their idiosyncratic signature as to what a space is, I intend to highlight an understanding of musical space as a sonic space, i.e. a space dependent on pitch organisation. In that regard, space enables a certain phenomenality

of sonic perception that is different from one typology of sonic space to another. This phenomenality is accompanied by certain physical effects the music has on the listener. On the other hand, the concern with spatialisation has to do with the notion of acoustic space – a separate notion from sonic space in that the spatialisation of music and the constitution of a sonic space specific to music are two different things. Thus, no music can escape dealing with space, as it develops concurrently with the sonic organisation of the musical phenomenon itself. We could therefore think of sonic space as a notion entirely defined by pitch organisation. Another way of characterising both notions is to think of sound space as an *intrinsic* space, dependent on spatial configurations generated by the relationships sounds have with one another. Acoustic space, on the other hand, can be thought of as an *extrinsic* space that deals with the physical spatialisation of sound in the space in which the music is being performed and heard. Of the latter, Stockhausen says that it constitutes a "new dimension of musical experience".[5] An appropriate way to summarise the specifics of both notions while maintaining in the listener's mind their conceptual proximity is to say that *acoustic space has to do with spatialising the music, while sonic space musicalises compositional space*. By the musicalisation of compositional space, I mean the characterisation of a space proper to music, an intrinsic component, as opposed to space in other artistic media, such as sculpture in its making or painting in its making.

Before turning to broader philosophical and political considerations, what provisional conclusions can be drawn from the previous reflections concerning the diversity of musical and aesthetic investigations to which the reevaluation of the notion of sonic space lends itself? First and foremost, it seems to me that the increased sensibility to space that distributed performance calls for, and which it helps shape as a musical parameter equal in importance to the four traditional parameters (timbre, duration, pitch, dynamics), highlights the need to question the idea of space as a 'given', as a compositional *a priori* – as a void component, deprived of any intrinsic qualities, that merely needs to be filled with sounds – or as a domain of music creation in and of itself that calls for an active elaboration. I have sought to indicate already that if I consider space to be a valuable means of questioning our auditory sensibility, this is precisely because it results from a deliberate compositional strategy or decision. If I do not think of musical space as an *a priori*, a void to be filled, I nevertheless consider it to be an *a priori* of our sensibility, as any trained musician will necessarily perceive its plasticity differently, from one composer to another, from one principle of sound organisation (tonal, atonal, etc.) to another. Music therefore does not 'happen' in a given metaphorical space, but it gives that metaphorical space its specific form or *Gestalt*. There is an expressive plasticity to music as much as there is a plastic expressivity to it. The category that we can deduce from these considerations is that of morphology: morphology of the musical figures and morphology of the sound space that results from these figures.

The particularity of being part of a networked performance is that two different spaces, that of the musical figures created by the composer(s)/improvisers and that of the virtual shared space, become spheres of expression that can be acted upon in such a way that the performers are hearing an actual polyphony of spaces: the space immanent to the pitch organisation, and the shared space of the performance that becomes

audible as such through the headset. This experience is particularly acute when using the software JackTrip.

Distributed performances call for an 'augmented' approach to musical composition, one in which sonic space is dealt with as a parameter of equal importance to the other parameters – both on a metaphorical level as well as on an acoustic level, and their mapping. Latency, too, can be turned into a compositional constraint from which imagination can flourish, rather than an impediment to real-time interactions. In a similar fashion, we must reconsider how we can make sense of the sonic organisation of these pieces on an analytical level. The question that arises is how to formalise new analytical models that would facilitate a taxonomy of the different approaches that composers and improvisers in distributed performances take as they develop a musical approach based on the particularities of the software. At stake is the possibility of giving an account of the phenomenality of sound and its physical aspects in a virtual acoustic space. In addition, the fact that the virtual acoustic space is the space perceived by the performers, not the one perceived by the audience members, who experience the rendition of the piece or improvisation on their computer, creates a disparity between the performer's and the listener's experience of the music.

## 5        Rethinking the artwork, decentring the composer

Network performance calls for reevaluating the notion of the artwork itself. As mentioned earlier, if traditionally the notion of presence in art has been linked to that of truth, the ontology of the work of art has to take into consideration the modifications that it has undergone since the emergence of the concept of telepresence.

The theory of telematics is rooted in questions pertaining to the philosophy of technology, notably that of the articulation of the social sphere of cultural practices and of the technological sphere. Concretely, this means that questions are raised about technological determinism applied to ensemble music – questions of 'reverse adaptation' (Langdon Winner) and of the social practices linked to the traditional practice of music in Western societies. To take a concrete example: how can telematics help call into question or reformulate a fundamental assumption of Western classical music such as the distinction between the categories of improviser and composer? While this question is not specific to telematics, network performance poses it with particular insistence. Besides asking whether network performance bears predetermined aesthetic attributes or whether it is a 'transparent' environment on which technological constructivism has no hold, then, the issue that I would like to address here is that of the decentring of the figure of the composer. In doing so, I hope to establish which aspects of the discussion are dependent upon the technological artefact, or made possible by the artefact, or whether this decentring is cultural in nature, i.e. emerges from the supportive and collaborative nature of the community of music practitioners who work with technology.

If telematics does not entail the death of the author in the structuralist sense of the term, it leads to what I would call a 'decentring and redistribution' of the role of the composer, concomitant with the reevaluation of the traditional distribution of roles in Western musical practices to which it also leads. Telematics has the ability to reformulate the spatial distribution of instruments, as instruments can be remixed and respatialised in real-time diffusion. This leads to a metaphorical democratisation of access to sound, as the musicians can reassign their placement in the virtual space, while heterogeneous timbres can be remixed and rebalanced. The hierarchy of roles assigned to the different instrumental groups in a classical ensemble thereby becomes scrambled and recoded. As for the role of the composer, it is in large part determined by the culture of the musicians participating in telematics concerts, as is exemplified by pioneering figures such as Pauline Oliveros: this culture by its nature and history encourages collaborative practices. The programme notes of the pieces *PicTyour-Score 2020 – Pandemic Edition* by Hassan Estakhrian and *Whose turn is it anyway* by Michele Cheng exemplify this tendency, as the composers position their works as the product of a collective effort. Both works were performed by the SNE in the period 2020–21, after its shift to online activity, and were composed specifically for this online performance environment.

## 5      Collective creation and student engagement

The question of international community-making is at the heart of networked performance. A significant example of this is a collaboration whose results, both artistic and musical, are still vividly remembered by the community of performers and musical technologists involved. In 2008, musicians from Beijing and Stanford universities were able to perform Pauline Oliveros' *The Tuning Meditation* with audio that the composer subsequently described as 'beautifully clear'.[6] This kind of collaboration highlights the importance of thinking of collective practices as a way to enhance a sense of community in music-making, precisely Oliveros' project in the aforementioned piece. At the same time, the technological means used make it possible for the participants to identify as a community, despite the almost 6,000 miles that separate the two campuses.

As artistic and musical director of the SNE, I have placed great value, during the pandemic, on cultivating a sense of community, of which students risked being deprived. The outreach initiatives extended way beyond the usual students who register for the ensemble, as online music-making with uncompressed audio and near-zero latency was made available to virtually anyone interested, regardless of their location at the time the pandemic started. CCRMA and the Department of Music sent tens of JackStreamer kits that contained a mic, cabling and a digital audio interface. The intimate sonic rendition of JackTrip, once the initial setup was done, made it possible for all SNE participants to maintain an ensemble musical activity in a virtual acoustic space that made them feel as if they were in the same 'room', even though some of them were thousands of miles away from the Bay Area, where CCRMA's servers are located. Because of the long distance, we frequently had to use a larger window size

with more latency, so as to avoid glitches and packet loss. That technological aspect itself determined musical and compositional strategies, in terms of what was possible and how.

Reflecting on my own experience using these tools in pedagogical settings, the community- building potential of networked performance is clear, especially in the context of the pandemic era. As a sense of belonging to a learning community was made very difficult for many students, the impression of shared audio space provided by networked performance – as opposed to videoconferencing software, which is designed for turn-taking in audio rather than simultaneity – conveyed the impression of being in the same room or space, even though the 'room' was the internet. This creation of a shared virtual space allowed for the formation of musical ensembles which connect across geographical distances, allowing students who spent significant periods of the pandemic in other states or other countries to remain connected with their classmates in a unique space for sonic sharing.

The question of technology (latency, quality of service, etc.) is not simply a question of the milieu in which music is being performed, a milieu which one hopes would provide optimal sonic rendition. The question of technology here is intramusical. Reevaluating the notion of sonic space in the light of its becoming an online virtual space implies reevaluating both the notions of sonic object and musical object, i.e. the notion of artwork itself. Rethinking the notion of the artwork implies questioning its genealogy. In the context of products of the mind, it means questioning the notion of authorship as it was inherited from modern philosophy, centred around the notions of subject and consciousness.

Highlighting the erasure of the authorial presence seems to involve a paradox. I have argued in favour of distributed performance as a musical practice that has the potential to dehierarchise the traditional roles of music-making as they are conventionally delineated by different specialisms, and thus to help marginalised practices by underrepresented artists and technologists gain visibility and audibility. The decentring of the authorial presence remains a paradox for as long as the discussion remains informed by subject philosophy. But a more eloquent and potentially fecund approach to the disappearance of the author may come from reconsidering the notion in a different philosophical context. For if we set aside the philosophy of consciousness, a holistic approach to philosophy of mind reveals itself to be a suitable analogy to the way musical minds interact with each other in a virtual space. In Barthes' text, the death of the author had "the birth of the reader" as its corollary. Now, to the question of whether the mind is 'inside' or 'outside', the performer can respond, with Wittgenstein or C. S. Peirce: outside, within the public sonic sphere.

## 6 Towards a conclusion: aesthetics and politics

Having presented what I believe to be some of the most salient aspects of networked performance, particularly in relation to the kind of use we made of JackTrip, and as I reflect upon these aspects, not only as a sequence of separate considerations, but as a bundle of problematics to be made sense of together, I would like in closing to offer

an outline of how distributed performance might help us think about the relation between aesthetics and the political. The work of Jacques Rancière provides a particularly eloquent account of this interrelation, with his notion of 'artistic regimes'; as does that of Jean-Louis Déotte, who in addition to politics and aesthetics managed to develop – through the notion of *appareil*, inherited from Walter Benjamin – a polyphonic dialogue at the crossroads of art, politics, the sciences and philosophy.

Rancière refers to aesthetics as:

> the system of *a priori* forms determining what presents itself to sense experience. It is a delimitation of spaces and times, of the visible and the invisible, of speech and noise, that simultaneously determines the place and the stakes of politics as a form of experience.[7]

For this reason, according to Rancière, the "distribution of the sensible" is what "is at stake in politics".[8] The redistribution of the attributed roles to which I referred above, made possible by networked performances conceived *natively* as distributed performances, therefore fosters a reconsideration of the political and ethical import of a sense experience that is made possible by the mediation of computers – that is to say, it questions computing ethics directly through the lens of aesthetics and politics. As it redistributes sense experience, networked performance thus gives form to communities that become conscious of themselves *as* communities as they display "what is common to the community, the forms of its visibility and of its organization".[9]

I only briefly mention these aspects that are currently central to my research on communicational activity, technology and philosophy of culture, so as to indicate perspectives that in my view live up to the task of thinking in the context of liberal democracies. In conclusion, I will just hint at potential further steps for my research that I think are the corollary of some of the ideas I have exposed in the present article.

The conceptual framework in which we can think freshly of an ethics of discussion has necessarily to be informed by the computing breakthrough of recent decades. Such a dimension was noticeably lacking in the attempts of philosophers in the late 1970s and early 1980s such as Karl-Otto Apel and Jürgen Habermas – a lack all the more disconcerting when one considers that information technology was at that time a blooming topic that directly impacted the philosophy of communication.[10] The idea of a virtual and metaphorical space for a community that defies attributed roles and rearranges the sense experience of the singular and the collective, the near and the far, entails the idea of an unlimited communication community, and of a reconfiguration of the sensible within an ethics of discussion that acknowledges the mediating role of the computer.

It is the question of 'community' that makes dealing with the notion of an ethics of discussion a necessity; and the particular modification that 'community' undergoes in the context of networked performance, as I have argued, is that of a redistribution of sense experience. JackTrip thus offers an analogy to the ideal community of communication, without needing to anchor it in an *a priori* that seeks to absolutely found the moral requirement in a transcendental pragmatics. From phrase to musical phrase, from proposition to philosophical counter-proposition, an ethics of discussion requires a continual exercise of judgment, without any guarantee of communicational felicity or infelicity, without searching for the consensus that precisely inhibits our philosoph-

ical faculty of judgment. Networked performance allows this reconfiguration of sensible experience, and hints at a way of approaching computer ethics in which human-computer interactions can help us imagine a potentially unlimited macro-ethics of communication.

# References

1. Weaver, S 'Editorial', *Journal of Network Music and Arts* 4/1 (2022), https://commons.library.stonybrook.edu/jonma/vol4/iss1/1, last accessed 2022/11/04

2. Loomis, J. M., 'Distal Attribution and Presence', *Presence: Virtual and Augmented Reality* 1/1 (1992), 113–119; Jones, S., 'Towards a Philosophy of Virtual Reality: Issues Implicit in "Consciousness Reframed"', *Leonardo* 33/2 (2000), 125–132; Hein, N., Schmitz, C., and Hahne, S., 'UnStumm | Augmented Voyage: A Platform for Telematic Live Performances in Augmented Reality', *Journal of Network Music and Arts* 4/1 (2022), https://commons.library.stonybrook.edu/jonma/vol4/iss1/6, last accessed 2022/11/04.

3. Miltiadis, C., Singh, S., Landau, F., and Gencoglu, O., 'How Can We Define Space?', LASER Talk at Aalto University (29 April 2021), https://www.youtube.com/watch?v=v9RyiObRM3U, last accessed 22/11/28.

4. Winner, L., 'Do Artifacts have Politics?', *Daedalus* 109/1 (Winter 1980; special issue titled 'Modern Technology: Problem or Opportunity?'), 121–136 (here p. 121).

5. Stockhausen, K., 'Musik im Raum', in Stockhausen, *Texte zur Musik*, Vol. 1 (Cologne: DuMont, 1963), pp. 152–175, (here p. 153). My translation.

6. Oliveros, P., 'Networked Music: Low and High Tech', *Contemporary Music Review* 28/4–5 (2009; special issue 'Network Performance'), 433–435.

7. Rancière, J., *The Politics of Aesthetics*, transl. by Gabriel Rockhill (London: Bloomsbury, 2004), p. 8.

8. Rancière, p. 3.

9. Rancière, p. 13.

10. I would particularly mention here Hiltz, S. R., and Turoff's, M. pioneering digital sociology study *The Network Nation: Human Communication via Computer* (Reading, MA: Addison–Wesley, 1978).