

Presence Rewired: The Re-materialisation of Digital Dance from the Sweatshop to the Pixel

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Abstract

This article examines digital dance, not in opposition to physical bodies but in material continuity with them. By offering an expansive notion of 'presence' in dance, we intend to supersede the binarism that condemns the digital as mere traces of the 'real' or as a blunt synonym for the 'virtual' and the 'immaterial'. We depart from a historical overview of attempts to capture bodily creativity into mediated forms according to the values of each epoch. Thus, considering the current moment of dance digitalisation immersed in the information society, we formulate our argument by discussing how presence and virtuality transcend within the attempts to digitalise dance. Later, we address how, although transformed, the material dimension of the body persists through its digital capturing. In the last section, we address the relational ontologies that the digitalisation of dance can unleash in diverse cultural contexts, as dance-data regains its virtuality.

Keywords

dance studies, digitalisation, motion capture, screen dance, virtual

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The relationship between digital and analog worlds is often misconstrued as oppositional or as if the digital supplants the analog entirely. This false dichotomy undermines the profound interplay between both realms. Brian Massumi (2021) critiques this binary, proposing that the digital and analog exist in a kind of ‘self-varying continuity’:

The potential for this becoming of the digital is missed as long as the relationship between the digital and analog is construed in mutually exclusive terms, as if one entirely replaced the other. A commonplace rhetoric has it that the world has entered a ‘digital age’ whose dramatic ‘dawning’ has made the analog obsolete. This is nonsense. (p. 155)

While Massumi’s insights primarily address broader digital culture, they hold an essential key for understanding the body’s mediation through digital technologies. His framing challenges the presumed inadequacy of bodily presence in an increasingly digitised era to rethink the corporeal as recurrent to the digital rather than as its obsolete source. In the aftermath of posthuman stances that have pierced the alleged impermeable integrity of the body, it is crucial to ask what would be the benefits of expanding the conceptual constitution of the dancing body as continuously enmeshed with the digital? What other subject(s), with their corresponding labour, would become visible if we shatter the ontological presuppositions about the figure of the dancer as qualitatively distinct and discontinuous from the digital images that circulate of their steps? In an attempt to grapple with these questions, this article examines the theoretical challenges of reconceptualising the body’s presence. By expanding the concept of presence to include its digital traces and material entanglements, we hope to equip the reader to think and respond better to the shifts that digital technologies introduce in our digital and analog worlds alike.

As such, first, we critically engage with the current state of affairs in the discourses on the digitisation of dance in the Anglo-Western academic context. We follow this critique with a historical account of older attempts to capture bodily creativity into pre-digital mediated forms. Thus, considering the current moment of dance digitisation immersed in the information society, we continue our argument by differentiating and then reconnecting the digital and the virtual. Then, the apparent dematerialisation of the digitalisation of dance is

reframed as an instance of re-materialisation that reconnects digital dance with its material traces. Finally, we address the digital–material–virtual continuum from the perspective of different situated communities and their varying ways of accommodating the analog with the computational in their movement practices. The consequences of dancing in and out of the digital are not exhausted as aesthetic phenomena; they also resonate with shifting ontological considerations of the body in particular contexts. Therefore, as we reveal our analysis on the mistaken equalisation of the digital and the virtual, this article offers a discussion elucidating digital dance as irreversibly embedded with the bodily labour and materialities that the restrictive notion of ‘presence’ in the performing arts has kept at bay from analysis.

The Construction of Presence in Anglo-Western Digital Dance

At least since the 1980s, the performing arts have privileged the unmediated live presence of the performer’s physical body as an ontological core, something that is especially pronounced in the works of Herbert Molderings (1984), Peggy Phelan (2003), and Ericka Fischer-Lichte (2008). While Diana Taylor (2003) critiques this privileging by proposing a dynamic interplay between embodied performance (the repertoire) and mediated forms (the archive), the broader discourse often relegated mediated representations of dance to secondary status for inscription and re-enactment. André Lepecki (2006: 26), for instance, describes how the book, as a spectrally charged medium in the early modern era, allowed for the invocation of the choreographic ancestors’ absent presence and their transcending will as masters to be revived. The notational book could be seen as an external device to the manifestation of the presential dance, constrained to trigger new subsequent events of unmediated performance a posteriori. To follow this stance would imply that the medium and its pages are still kept at bay from the conceptual constitution of dance itself.¹ As an antidote to this, Lepecki provides the coordinates for a generous conceptualisation of dance as a substrate that circulates *across* recurring phases of de/re/materialisation. From that perspective, dance glints as a

dynamic, transhistorical, and intersubjective system of incorporations and ex-corporations [. . .], that which passes away (in time and across space) but also as that which passes around (between and across bodies of dancers, viewers, choreographers) and as that which also, always, comes back around. (Lepecki, 2006: 39)

This formulation facilitates the disruption of customary binaries between live and mediated performance, offering a potential framework for examining how digital technologies participate in the cycles of (re)emergence of performance through different material instantiations. Following the same rationale, but abandoning the mysticism of the dance book to replace it with contemporary digital technologies, there is a different series of evocations taking place. Motion capture digitisation facilitates choreography to traverse across spaces, times, and bodies in ways that demand a more encompassing conceptualisation of the dancing body that does not keep the media that record it at the margins of its presumed uncontaminated ontology. Since the 1990s, alongside the growth of research that has occurred in the digital humanities, the interrogation into ‘digital dance’² (or perhaps more broadly the mediation of dance by digital devices) has developed and established itself as a (sub)field within creative dance practices still awaiting fundamental theoretical accommodations (Blades and deLahunta, 2020). Some of the important steps in this direction involve, for instance, the work by Scott deLahunta, an early adopter of digital tools for practising and researching Western contemporary dance, as well as the scholarship of Dan Strutt on motion capture. Strutt contends that the mediated presence of a dancing body, instead of being a lamented cause of disembodiment, as seen in the early media discourses on digitisation, could be a feasible leeway to understand how corporeally charged philosophical thoughts are while simultaneously rendering visible the cognitive labour already present in movement (Strutt, 2025).

Moreover, Blades and deLahunta (2020) offer a provocation that can be taken as a point of departure. In their recent article, they encouragingly suggest that the current scientific aptitude of digital dance should encourage the reformulation of ‘the right questions for dance studies’ (p. 31). One of the main fronts that requires revisitation here is a non-humanistic notion of the ‘presence’ of the dancing body as it is more and more frequently abducted into digital

databases. Unfolding a similar preoccupation, deLahunta and social anthropologist James Leach discuss the work of choreographer Wayne McGregor, also an early adopter of the digitalisation of dance. They examine the unique qualities of the body in contemporary dance practice through tailored digital choreographic objects. In studying McGregor's efforts to develop an entity (a digital body) that could serve as a tool for movement composition, Leach and deLahunta observed that the particular impact generated on other bodies through dance-making is directly correlated to the kind of presence the body holds. It is a statement that directly interpolates the aforementioned definition by Lepecki of dance as an intersubjective substance traversing across the bodies of dancers, viewers, and choreographers. In McGregor's words: 'You cannot be in the same space as another body and not feel a response' (Leach and deLahunta, 2017: 465). Yet, plugging this assertion back into the main research question of this article, we would propose the following: *You cannot respond to another body if you ignore all that its presence encompasses*. The fact that bodies elicit social-kinesthetic responses in other bodies is crucial to understanding the essence of dance-making, but we argue that there is a series of other bodies that partake in the production and circulation of digital dance, whose corporealities and labour still need to be reckoned with beyond discussions on art's reception. The stakes then are higher and exceed the performing arts field and embark in the direction of studies on the body.³ By offering an expansion of the presence of the moving body and extending it to the traces it leaves through digital media, we expect to offer a theoretical amendment that can render visible the ongoing articulations of digital dance with ecology, political economy, and the material constitution of technology.

A Posthuman Body Sculpted by Information

To better understand the current posthuman sensibility present in the interpenetration of the human and the technological, and thus manifesting in the assembling of digital dance, the following lines contrast it with the framing that European humanism did of choreographed movement as an illustration of divine geometry. While Italian dance masters of the 15th century legitimised their inscription practices by ascribing them to the humanistic values of their era, choreographers

of current times push for the recognition of movement practices as activities with epistemic value, ready to be capitalised in what Leach (2016) has labelled our contemporary 'knowledge economy'. Back in the 15th century, dance masters such as Guglielmo, Domenico, or Cornazano claimed in their treatises that human movement was the externalisation of the same principles of harmony and symmetry that were so highly praised in music, geometry, arithmetic, and astronomy – the disciplines of the then regnant humanistic *quadrivium* (Nevile, 2004). However, current discourses and scholarship about dance embracing rhetoric centred around embodied knowledge directly correlate with the contemporary technical developments that transform the dancing body into digital information to be grasped, captured, and measured. However, the claims to validate dance and movement through knowledge-related buzzwords are not proclaimed within a social or cultural void. From the field of dance history, it never has. To understand how dance in the Renaissance became an elite bodily practice relevant to the legitimisation of the civilising process, it is imperative to consider how its principles and related discourses were tailored to appeal to the contingent zeitgeist of humanism (Nevile, 2015). Similarly, either to increase the recognition of dance as a scholarly field, to boost the chances of obtaining funding, or even just by falling prey to contemporary cybernetic imaginaries, academics and practitioners of today translate dance into information and knowledge because knowledge has become a value term in its own right as part of the posthuman ethos.⁴

While the dance masters of the *Quattrocento* used the humanistic categories and principles to frame choreographed movement sequences as that which could grant access to the divine, the current digitisation of the dancing body pledges to the knowledge economy by encumbering the digital technologies that can transform it into data. The reconsideration of movement not only as an aesthetic regime but as a possible avenue for knowledge production allows dance to enter 'the rational and discursive production of knowledge in science' (Klein 2007: 28). This new disciplinary grouping of the arts and sciences together holds a symmetry to the aforementioned *quadrivium* of the Renaissance era, but its effects are far different. Since information technologies transform movement to make it visible and readable for machines (Ring, 2021), by turning dance into data points, bodily

practices recorded through motion capture technologies are now intelligible primarily for computers, not humans. As Kriss Ravetto-Biagioli (2021) states, ‘Unlike their analogue equivalents, digital modes of capture are not “directly iterable”: they cannot be reduced to a “techno-human experience of these media” since they involve the translation of the recorded figure into a set of data or data body’ (p. 5). Due to such legibility, the datafication of dance does not allow for the dancer to access divinity as it was believed in the *Quattrocento*, but a world of allegedly immaterial data.

There is, however, a long lineage of abstracting and coding bodily movements before the advent of the digital era. A certain choreographic impulse behind the intent of coding movement by its kinetic composition was at play even before dance entered the digital *milieu* (Portanova, 2013). Examples of this are the geometrisation present in the treatises of the aforementioned dance masters of the early modern era, but also the different notational systems of the 19th and 20th centuries, including Labanotation. Saliently, the current incursion of dance in the digital is also marked by the incursion of the digital in dance. As Portanova (2013) remarks from a philosophical angle, ‘Rather than having a moving subject measuring its own relation to movement and space through numbers, it is the number that now becomes a subject, through the becoming-number of the moving body’ (p. 102). This becoming-number of the moving body could be mapped onto the erasure of physicality and dance practices into the neoliberal logic of archiving (Bench 2016: 157) that upholds knowledge production as its teleological beacon.

Motion capture technologies, for instance, translate bodily movement into numerical data, enabling unprecedented precision in capturing choreographic nuances. Scholars like Kriss Ravetto-Biagioli (2021) and Harmony Bench (2016, 2023) have noted that this process abstracts movement from its fleshly context, creating a ‘data-body’ that exists independently of the physical dancer. Such abstraction aligns with the epistemological premises of the information society, which prioritises legibility and reproducibility while rendering invisible the human labour behind it. The datafication of the dancing body is thus embedded in the wider notions of postindustrial society, media society, or information society – in awareness of how problematic such periodisation can be – that Jameson (1992) considers being all

synonyms for the cultural paradigm of the postmodern era.⁵ If the premise of ‘dance as knowledge’ is taken as an omen, it could be said that it was properly fulfilled: bodily practices have made their way into the information society via ‘digital circuits thanks to interfaces of acceleration and simplification: a model of bio-info production [. . .] that produces semiotic artifacts with the capacity for the auto-replication of living systems’ (Berardi 2009: 38). Beyond the overarching angst surrounding technological developments, which are usually accounted for through a ‘paranoid reading’ present in much critical theory (Sedgwick 1997), these technical transformations could be used as the opportunity to expand the field of visibility of the body’s material constitution. Thus, discussing the continuity of dance into the digital is not done here from a pessimistic angle but from the intent to take the information society to its limit, exhaust its conceptual gravitas, and hopefully push towards a different paradigm.

Reconnecting the Digital with the Virtual

New technologies for the digitisation of the dancing body advance the technical possibilities to grasp the nuances of dance movements to the millimetre while also collapsing diachronic spatio-temporalities for the production and consumption of dance. Put simply, no need to be *there* and *then* anymore in order to experience it. It is in this collapsing that the virtual recurs as it encounters infinite *there(s)* and *then(s)*. According to Brian Massumi’s field-defining book, *Parables for the Virtual*, there is nothing virtual about the digital, contrary to the common interchangeability in their use. Because of its preprogrammed nature, ‘digital coding per se is possibilistic to the limit. Nothing is more destructive for the thinking and imaging of the virtual than equating it with the digital’ (Massumi, 2021: 149). The eventfulness of the virtual wherein the ‘new’ can appear is practically afforded by recombinations of elements that exceed the digital and its preprogrammed possibilities.

Step after ploddingly programmed step. Machinic habit. ‘To array alternative states for sequencing into alternative routines’. What better definition of the combinatoric of the possible? The medium of the digital is possibility, not virtuality, and not even potential. It doesn’t bother approximating potential, as does probability. (Massumi, 2021: 149)

Thus, the digital is only the quantitative systematisation of the possibilities of an enclosed system that is defined a priori. Differently, eventfulness and potential are at the core of true virtuality, needing the quotient of openness that bodily enactment (and its inconsistent variations) implies. Hence, virtuality is aligned with the inconsistencies and ultimate creative newness that are only possible when they encounter the friction of different spatio-temporal occurrences that digital dance faces as it circulates and reimpacts the physical bodies of audiences and practitioners. But what does this friction imply in terms of the reconfiguration of the presence of the dancing body?

Digital platforms enable dance steps to circulate globally through online repositories, gamified experiences, videos, and new media. By providing the dance without the dancer, motion capture offers a de-subjectified version of movement; recordings of dance are data ‘stored in their physical sub-personal mode of being. They are comparable to measurement data in the natural sciences’ (Bakka and Karoblis, 2010: 181). This mutation, performed through a technology that aims to both capture and understand movement, summons the emergence of the datafication of dance and the ensuing emergence of a ‘data-body’. This type of body ‘exists as an abstract archive of gestures, purchases, movements, biorhythms, likes, and dislikes, which are decoupled from the actual body’ (Ravetto-Biagioli, 2021: 21).⁶ With the flick of a wrist and a scroll of a thumb, an unprecedented repertoire of dances from different times and places is now available to be perceived, reproduced, bought, remixed, and played out within digital platforms for shape-shifting users. The digital captures of dance inhabiting the digital space propagate and get back into the ‘real-world’ dance floors, as they are reincorporated by new generations of human dancers. Following Fazi’s (2019) discussion on the unavoidable gap between the continuity of lived bodily experience versus the discreteness of digitalisation, we problematise not only the abstraction of movement into data but also its later availability. Crucially, this is the moment when the digital has the chance to regain its virtuality.

This intermingling of dance data populating analog and data-bodies interchangeably has, in turn, produced a sense that the dancers’ presence is not disturbed by the digital, but rather constituted alongside it, as if bodies were about to enter the digital or could do so at

any given moment. As Kaye and Giannachi (2011) observe, 'Indeed, the contemporary ubiquity of personal and social media also drives a sense that the presence of others is always already compromised or constructed in palimpsestual relationships' (p. 98) between the analog and the digital. Hence, even when 'presence' has been framed as the result of the throbbing live physical interaction of unmediated performing bodies, its effect and extension do not exhaust once they leave the room. Kaye and Giannachi (2011) have probed how the audiences of new media performances perceive intense experiences of the presence of performers 'in, rather than despite their apparent immateriality and artificiality' (p. 90). Put differently, these experiences of mediated presence can still afford to elicit social-kinesthetic responses (Leach and deLahunta, 2017). Based on these accounts, it could be argued that presence is untethered from being a 'quality inherent to the physical body' only reachable through ephemeral live perception, but rather a relational and contingent affect established 'in the real or illusory stabilities of a specific time and space', be they analog or digital (Kaye and Giannachi, 2011: 91). This reencounter between the digital and the virtual, as dance data passes away, through and around human- and data-bodies, hints towards the continuum at play between the two realms on an interpersonal level, but material permutations are also revealed to be at play if we examine the micro-scale of the insides of gadgets and devices that facilitate dance's digitisation. The following section is centred precisely on this subject.

Reconnecting the Material with the Digital

Beyond doubling down on the romanticisation of the lingering effects that persist once the body of the performer leaves the room, or a post-structuralist deconstruction of the binarism between presence and absence as mutually depending concepts (Charmatz, 2014; Pritchard and Mawdsley, 2010), this section highlights the causal and material orchestrations that take place through the digitisation of the physical presence of the dancer/performer through digital technologies. Granted, the digitisation of dance allows for an expanded circulation and reproducibility of choreographic material. However, despite popular beliefs lined up against it, dance's digitisation can never fully attain a complete dematerialisation of dance, but rather only its

re-materialisation. This remaining balance that still needs to be reckoned with, reverses the invisibilisation of the material expenditure that current understandings of ‘unmediated’ presence in performance studies make. As a precedent to this critical approach to digital technologies, photography and film were framed by Susan Sontag (1977) as media that have reality carved in their physical composition as opposed to merely representing it. Sontag’s materially driven appraisal of photos as ‘footprints’ (Sontag, 1977: 120) is substantiated through an emphasis on the striking photosensitive emulsion of the medium that directly engraves objects, their volumes, shapes, and proximities into the resulting images. Such a material scrutiny of digitised dance should similarly emphasise the emergence of images on screens as a result of its corresponding series of electrochemical reactions.

Following this cue, then, the dancing body recorded through motion capture can also be thought of as a re-materialisation of choreographic material rather than its dematerialisation, even if seemingly reduced to images on a screen. From the electrical conduits of miniature circuit boards that spark devices to the mineral-based regulation inside of them to the condensation of luminosity on the screen, all of these material and chemical reactions are orchestrated by the contours and shapes traced by the physical presence of the recorded dancer. Suffice it to say that digitising a body does not imply its physical disintegration; instead, it is a morphing of the moving figure into ‘a series of numbers, and then a constellation of luminous and acoustic pixels that, disposing themselves according to the combinatoric of the algorithm constitute a field of perceptual potential’ (Portanova, 2013: 38). The combinatoric algorithms and pixellated grids perceived as abstract and ethereal still hold a correlation to the physical reality that they were generated after; that is, ‘numbers, points, and lines’ always result from the ‘spatiotemporal thickness of events from which they are abstracted’ (Portanova, 2013: 63). While keeping this lineage in mind between the physical event of dance and its inscription, finally, a meeting point between the two can be established. The illusory immateriality of the digital that keeps reinstating the split between an analog physical presence (incorporation) and a secondary immaterial layer comprised of the materials that record it (inscription) is, on a micro-scale, completely fictional.

At the lowest level of code, machine language, inscription merges with incorporation. When a computer reads and writes machine language, it operates directly on binary code, the ones and zeros that correspond to positive and negative electronic polarities. At this level, inscribing is performing, for changing a one to a zero corresponds directly to changing the electronic polarity of that bit. (Hayles, 1999: 274)

That is to say that, in fact, incorporation and inscription, material reality, and informational representation hold such a tight continuous symmetry that at a very basic computational level, they are one and the same. Twists, turns, and jumps of a physical dancer unleashing specific electric polarities on the devices that record them are thus more than a poetic allegory for the interpenetration of the human and the machinic as a cybernetic fantasy; they are evidence of the self-varying continuity that digital and analog dance produce in their uninterrupted material regeneration.

To recognise the material continuity between physical dancers and the digitality of their images on screens is only half of the story of the material transposability of dance data. Within a posthuman awareness, the re-materialisation of a moving body, traceable once dance makes its way into the digital, requires another series of material events and physical contingencies as its condition of possibility. The operation of visibilising the connection between circuit boards and the physical performance of a dancer affects the scope of analysis and representation in a way that undoes the effects of the hidden but pervasive humanistic notion of a unitary, self-contained, liberal, and impermeable (Braidotti, 2006) body, uncontaminated from its environment. A reformulation of the concept of presence within the digitalisation of dance, hence, should reverse the invisibilisation of the interpenetration of the dancer's body with its material surroundings as per humanistic and anthropocentric standpoints. Hence, the phenomena related to other seemingly disconnected aspects that make digital dance possible, including the corporeal toil of underage miners collecting coltan for mobile phones, workers at warehouses assembling and packaging technological devices, and the strenuous manual labour training machine-learning systems' algorithms (Firmino-Castillo, 2024: 225), resurface at the centre of the debate.

To that effect, presence in digital dance could be thought of as the material friction (bodily or otherwise) required to render human movement within a specific code or visual frame, on its way to recover its lost virtuality. Even if through diachronic encounters, digital technologies remain in continuous enmeshment with that material friction. These diachronic encounters, in the case of digital dance, trace an itinerary that constitutes a unique choreographing of aesthetic, economic, and electric–chemical phenomena, alongside the labour of those whose bodies mediate the transformation of dance into data (dancers but also sweatshop workers, miners, and engineers) that only becomes visible through this expanded scope. The accent on electric–chemical phenomena gives this notion of presence a posthuman and non-anthropocentric flair, while the emphasis on the conditional labour executed outside of the world of art shatters the class-based circumscription reified in previous debates around ‘presence’ in dance. But to flesh out even more the idea of the continuous enmeshment of the digital with the material, we proceed now to focalise the importance of the situated lived experience in the digitalisation of dance and its virtual potential. Following Donna Haraway (1988), we could argue that the digitisation of dance also happens within a partial vision from the depths and peripheries that overlap when the receptors of the dance are located in dissonant spatio-temporal conditions from where it was codified and where the digital coding itself was created. The ensuing cases describe how virtuality is recovered as part of spatio-temporal tensions that generate a particular relationality challenging the ontological understanding of dance or movement practices from an exclusively Western and academic perspective.

The Relational Virtuality of Dance-Data

The reconfiguration of presence stemming from the digitisation of dance hinges on recognising the relational and material continuities that connect the analog and the digital. The production and circulation of dance as data, however, is not restricted only to Western contexts of contemporary art and performance. From a relational ontological view, that is, on the level of the ‘stories we tell ourselves about what exists and how these things exist in relationship to each other’ (Blaser in Firmino-Castillo, 2016: 56), there is not one single

way to understand the hybridity of digital dance. By situating dance within the broader field of body studies beyond the Western performing arts tradition, this section compiles three cases of analog–digital encounters that dislocate the discussion towards other locations and epistemologies. To fracture the assumption of a unitary interpretation of digital dance, it should be noted that the abstraction of dance into a numeric order did not start with motion capture technologies or enterprises from tech giants of Silicon Valley. Instead, it goes back to the Italian masters of the Renaissance, when a need to render dance steps in a written form,⁷ as shown in the notations of Fabritio Caroso ‘Il Ballarino’, published in Venice in 1581, combining ‘text, tablatures, and illustrations of attitudes’ (Norman, 2016: 187) arose. Such notations were based on descriptions of the dances through words and geometric abstractions and diagrams, ‘where cumulative movement traces are made to converge in a unique image (or dense, consecutive images, combining serial and non-serial representational modes)’ (Norman, 2016: 187). Fast-forwarding to the 19th century, in dialogue with the archival of dance notation under the frame of the safeguarding of heritage, digital technologies have pushed the recording of human movement to a heightened degree (Franko and Nicifero, 2018). Contemporary technological affordances for the digitisation of the dancing body propel conceptual reconfigurations, but it is the pragmatic perceptual impact on the communities of practice in situated contexts that foregrounds a potential opening to be thought of as a kind of human-and-more-than-human encounter.

How do numbers intervene in the world, then, from multiple ontological narratives about the digital? And, how are such understandings indebted to how different communities of practice engage with their own digital representations? Using technologies to understand the ontological notions of *othered* dance-music cultures, researchers in these fields discuss how the heightened techno-human cross-pollination impacts dance genres around the world. As a first example, we follow the work of anthropologist and performer Silvia Citro and the Team of Body Anthropology and Performance.⁸ Drawing from her collaborative research projects with indigenous Qom dancers from El Chaco in Argentina, Citro (2021) has elaborated on the sensory-emotional inscriptions in the body through digital audiovisual means. Inspired by the context of the 2020 COVID-19 pandemic, in which

all the interactions between dance practitioners happened through video calls, she formulated the notion of ‘digital communitas’. In the collaborative project, practitioners of the Qom communities explored technologically mediated empathy and collective mimesis as a way to induce sensitive and affective inscriptions that were not only significant but, saliently, considered legitimate for ritual effects. Digital encounters with Qom musicians and dancers are here regarded as meaningful experiences that ‘accumulate, sediment and actualize the affects and senses, thus temporally and spatially reviving, reincarnating the bodies as if the mediation in between the [digital] signs and entities would vanish in order to fuse in an existential torrent’ (Citro, 2021: 127). Saliently, here the mediation of the performing body is not only seen as relevant for aesthetic or artistic purposes but also as useful for ritual practices that go beyond the secularised preoccupations on whether a work is a performance or not, or around the dancer ‘really’ being there or not.

From a different geopolitical location, the Isthmus of Tehuantepec, *muxe* choreographer and performer Lukas Avendaño,⁹ has used digital tools in her performance practice to contest ‘gender binaries, digital dualisms, and other dichotomies that undergird the necropolitical formations of an enduring coloniality’ (Firmino-Castillo, 2024: 202). Considering the indigenous Zapotec ontological understandings of gender and their relation to the clouds and the earth, Avendaño shares how Indigenous art should not be deprived of technological explorations nor be forced to fall on either side of the oftentimes dichotomical framings within the arts. In the dialogue between Avendaño and scholar Firmino-Castillo, they reflect on how virtual reality and three-dimensional (3D) body projections used during Avendaño’s durational interactive performances ‘invoke in and through her body the transhistorical presence of the *muxe* and other sexual dissidents’ (Firmino-Castillo, 2024: 207). In this case, the use of technology is enunciated already as a resource to extend the physicality of the performers’ bodies and also to hint at the lineage of the *muxe* experience across more than the present time of the performance. The technological devices employed here, then, are not instrumentalised to obscure the continuity between different temporalities nor between the digital–analog continuum but rather to mirror an Indigenous understanding that accommodates opposing polarities of

the technological, gender, and sexual spectrums. The bridging between life and death, between male and female, and most saliently, between the digital and the analog as non-discontinuous is, in Firmino-Castillo's formulation, the 'ouroboric' (Firmino-Castillo, 2024): a self-birthing regenerating force that substitutes mutually exclusive antagonisms for complementary paradoxes.

Such an embrace of conflicting categories can also be found among European communities, as ethnomusicologist Filippo Bonini Baraldi (2020) recounts from his incursion among a Roma community in Transylvania, Romania. After inviting Roma cultural bearers to a motion capture laboratory to explore the movement technique of traditional violin bowing, he was surprised by how the 'skeletons' – digital figures made of rudimentary sticks and dots rendered by the smart viewing software – were very well received in the community. While viewing the motion capture videos, Roma musicians were not only able to recognise the person and kinship of each of the skeletons, but they also expressed a fascination with their 'humanity' (Bonini Baraldi, 2020: 373). From the perspective of these practitioners, the motion capture skeletons represent 'immortal images of the person, grasping their essence beyond the dimension of time: a quasi-metaphysical experience' (Bonini Baraldi, 2020: 375), crucially relevant for the transmission of the practice to the younger generations. Here, the reception of the mocap figures by the Roma practitioners is regarded as one of many ways by which the incursion into the digital is revealed as compatible, rather than interfering with tradition, in the frame of a responsible practice that reciprocates the communities who participate as research collaborators. The superposition of the digital and the analog is, thus, in different ontological understandings not necessarily contradictory. In other words, digitised movement is not only related to art and creativity; it can also be mapped onto relational ontologies that transcend the human–human encounter in the direction of human–more-than-human exchanges. Saliently, in Bonini Baraldi's case, the motion capture skeleton is assimilated into an ancestor or an entity that transcends human subjectivity, extending the possibilities of a kinship system that thus encompasses the unmediated experiences of bodily musicking alongside their digital extrapolations.

Instead of debunking conceptual formulations surrounding dance and other movement practices solidified on the basis of the unmediated presence of a performer's body, immediacy and digitality are, in

the previous examples, revealed to be accommodated in alternative non-antagonistic ways that relate to alternative and expansive understandings of gender, ritual, and tradition. The 3D sticks and dots of motion capture have been negatively assessed in the past as a reduction of analog movement, but the multiplied eventfulness of their presence across devices and machines triggers new relational encounters that vivify dance's virtuality from multiple ontological stances. Then, beyond championing dance only in its analog form, it is imperative to acknowledge that the digital realm is pushing the frames of knowing dance and movement across different cultural contexts, not exhausted in Western contemporary art nor in Eurocentric understandings of digital culture. Ultimately, acknowledging the reconfiguration of presence among digital and analog dance is a political and ethical imperative to bring into the picture alternate ontologies and understandings alongside the labouring bodies of dancers, machines, manufacturers, miners, and data collectors across different temporalities and situated bodily practices. Doing so is a preparatory exercise to better respond to the aesthetic and political needs of a world increasingly choreographed by digital forces.

Finally, Whose Presence Is Immanent in Digital Dance?

The conceptual reconfiguration of presence for the digital mediation of dance presented in this article plunges into the friction of the digital and the analog to ultimately expand the material, virtual, and ontological scope of analysis of the images of dance inside the perimeter of the screen. As a result of the non-anthropocentric account of digital dance that influences the discussion of this text, an urgency for cross-disciplinarity emerges. To think of the material friction that computerised movement assumes and requires to virtualise itself implies considering the corporeal labour and material expenditure of those whose bodies intervene in the production, perception, and circulation of dance as data, as in the case of the Qom, Roma, or Binni Zaa practitioners, but also of those mining for, assembling, or manufacturing the technological devices we consume. Hence, while expanding the scope of analysis for the digitisation of dance, bodily effort is to be traced beyond aesthetic and artistic implications and in the direction of political economy, ecology, and the natural sciences at large. The definition of presence offered here is designed to serve

as a hinging point so that the choreographic and kinetic expertise of dance studies can target within its scope not only the gestures of the dancer inside the screen but also of those workers in precarious sweatshops where smartphones are assembled or where data is annotated for the development of more accurate artificial intelligence (AI) algorithms. If the analytical reach of the fields formally known as screendance, digital dance, dance on the screen, and dance on camera is extended to these other fields, movement analysis will reveal itself to be a suitable framework to examine the overarching choreographies at play between different kinds of labour. The recognition that the production of digital dance implicates a vast network of bodies, industries, and ecologies is an intent to push through and over the humanistic bias that surreptitiously keeps reinvesting in examinations of the single dancing body as a cultural paramount in discontinuity from its material surroundings. If the agency of dance practitioners is becoming depreciated due to the documented precariousness of dance labour (Van Assche 2020), we wonder how the expanded account of digital dance offered here could favour the labouring conditions not only for dance practitioners but also for others beyond the field. We concur with scholar María Firmino-Castillo (2016) on how the ontological considerations we forge through bodily practices will contribute to either survival or collective demise (p. 70) and hence, what we consider to be present within the conceptual perimeter of dance, of the stage, and the screen will have political effects in 'more worlds than we know' (Firmino-Castillo, 2016: 70).

Whether understood as affective inscriptions within ritual settings, ancestors, or 'ouroboric' traces, digital and analog materialities integrate into the many realities experienced by practitioners and the stories told about them. By tracing the material and corporeal substrates of digital dance, the hidden labour and ecological expenditures that underpin its apparent immateriality resurface. If the conceptual reconfiguration of presence for digital dance is useful for anything at all, it should be to equip ourselves to respond to the aesthetic and political crossroads where the heat and effort of workers and dancers are choreographing the movements we get to experience on social media, online repositories, and the dancefloor. When the sheer fact that people are using their bodies in significantly different ways because of technological innovations (Hayles, 1999: 207) is approached only as an aesthetic phenomenon, it reinstates a discursive isolation of the

humanities vis-à-vis the undeniable weight of matter, electric–chemical, and other natural phenomena that make the ‘screen’ in ‘screendance’ possible. To triangulate between inscriptions, incorporations, and technological materiality would imply bridging the discursive analysis of the humanities with the other apparatuses that recur in the feedback loops of how technology comes into being, and digital dance might be the best place to start this exercise.

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Notes

1. Here we follow Derrida’s elaboration on the apparent dichotomies of orality and written text to address the difference of the physical dancing body and its digital iteration: ‘The imprints of writing do not inscribe themselves this time, as they do in the hypothesis of the Thaetetus, in the wax of the soul in intaglio, thus corresponding to the spontaneous, autochthonous motions of psychic life’ (Derrida 1981: 104). Derrida identified how, for centuries, Western epistemologies have insisted on a certain ‘metaphysics of presence’ whereby orality and unmediated physical presence are preferred, in opposition to the materials that recover and record their traces (texts, photography or, in the case of bodily, video, and new media). Hence, following the presence of the pharmakon as simulacra or as the ‘disappearance of any *originary* presence’ (Derrida, 1981: 168), digital manifestations of dance can be regarded as an ontological reality in and of itself that catalyses particular meanings according to the situated communities of practice or performance.

2. The term 'digital dance', as formulated by Blades and deLahunta (2020), refers to dance-making processes and performances that include digital technologies as an integral feature.
3. Elswit and Bench (2023) have also addressed the complexities of digitalising embodied knowledge in a process that they label as 'visceral data analysis'. For the scope of this article, we focus on cases in which the digitalisation of dance becomes a presence in the performative practice. Hence, even when we do not refer to studies that use digital methods as a way to analyse dance practices, we consider that digitalisation as a research methodology is a relevant layer that can have ontological consequences on the dance practices or performances since its results might equate with the rendering of presence, as we reveal further on.
4. Furthermore, the enmeshment of humans and machines is also at the core of social concerns and recurrent fears of an 'imminent threat of ecological disaster, genetic mutation or immunity breakdown' (Braidotti, 2006: 33). Such new articulations of bio-technological layers are mapped out and described by Katherine Hayles, on an evolutionary basis through the notion of 'technogenesis' (Hayles, 2012) and also in terms of cognitive transformations through the concept of 'techno-human assemblages' (Hayles, 1999). Through genetic, cognitive, cultural, and evolutionary terms, these theorisations are fleshing out the shift towards posthuman ideas of life, but there is a persistent balance that needs to be reckoned with on the conceptual and ontological fronts for dance, regarding the material continuities that it traces as it is transposed to and from the digital.
5. Jameson stresses how material signifiers overload the current present in what he calls the 'breakdown of the signifying chain': 'This present of the world or material signifier comes before the subject with heightened intensity, bearing a mysterious charge of affect, here described in the negative terms of anxiety and loss of reality, but which one could just as well imagine in the positive terms of euphoria, the high, the intoxicatory or hallucinogenic intensity' (Jameson, 1992: 73). Hence our stance is to transform such 'loss of reality' in a bodily reality itself that encompasses the creative gap of the digital realm approaching physical bodies.
6. Gavin Smith (2016) contributed with a notion that informed the formulation by Ravetto-Biagioli, not necessarily under the rubric of a 'data body' but a 'data-proxy' that consists of 'an abstracted figure created from the amalgamation of data traces which serves as a representational signifier of selfhood in networked transactions' (p. 3).

7. The pressing anxiety around preservation of dance in the European context was palpable too in dance masters like Thoinot Arbeau (Jehan Tabourot), who manifested to his interlocutor Capriol: 'I foresee then that posterity will remain ignorant of all these new dances . . . Do not allow this to happen, Monsieur Arbeau, as it is within your power to prevent it. Set these things down in writing' (Lepecki in Bench, 2016: 157).
8. For information on the working group and their research, please see <https://www.antropologiadelcuerpo.com/>.
9. *Muxe* can be understood, from a reductionist perspective, as a socially recognised third-gender since pre-Columbian times. Although the nuances of this category escape the scope of this article, it is important to recognise that it is not directly translatable to Western formulations of queerness/cuiriness. 'Lukas Avendaño is socially enunciated as *muxe* by the Zapotec – or Binni Zaa (Didxazaa; *binni*, 'the people' and *zaa*, 'from the cloud') – community in the Isthmus of Tehuantepec that Avendaño is a part of' (Firmino-Castillo, 2024: 200).

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