An Alien Phenomenology in Dance: Virtual Telematic Performances as Embodied Philosophy

–– Dan Strutt

(UNIVERSITY OF LONDON)

ORCID: 0000-0001-5169-1145

This article suggests that dance practice-led exploration of avatar embodiment and telematic performance in 3D virtual environments (such as those generated in real-time graphics engines) can be a meaningful mode of philosophical discovery—a mode of affective doing, creating, becoming, and embodied thinking. By exerting kinaesthetic agency and shared expression within corporeal forms that are both of our body and yet virtual as well as in avatar representations that do not necessarily correlate to our actual anatomical articulation, can we explore a new remote relationality of extended, non-human, or alien embodiment within virtual space? I explore the possibility that, if this experience is indeed philosophical, it can be expansive and joyous, critically and socially engaged, and even ethical in nature, despite the techno-political forces of capture and control which are understood to be at work in so-called *volumetric regimes*. To consider this I draw upon a proposed alignment of ideas from Ian Bogost (from "procedural rhetoric" to alien phenomenology) and from Laura Marks (unfolding-enfolding aesthetics and the "talisman image") to think about

virtual media forms that enhance dance's inherent virtuality and its propensity for kinaesthetic metaphorism, ethical intersubjectivity, and play.

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Film philosophy suggests that the relationship between philosophy and cinema can be understood in a couple of different ways: that films can act as a bridge to the understanding of philosophy (i.e. that they "represent" philosophical principles in action), or that they might be said to "do" philosophy, enacting it through audio-visual forms and processes. In this second mode, film becomes not just representation, but rather a form of somatic thinking through syntheses of bodily sensations that turn affects into percepts, and then into concepts, to yield "new" experiences that are not reducible to existing thoughts. It was the specific perceptual and phenomenological experience of cinematic time, alongside the ineffable quality of *photogenie* (Epstein), that for twentieth-century theorists allowed film to reveal the real world in newly sublime and powerful ways. Film, for these writers and their intellectual inheritors, added a new dimension of reality such that we can talk about the evolution of a cinematic consciousness, and an ontology of film (and other derived audiovisual media) that actively *shapes* our embodied, affective awareness of what is real in the universe, rather than simply representing it (see discussion on Cavell, Badiou, and Deleuze in Mullarkey, *Refractions of Reality*).

Within our current post-cinematic audiovisual culture, we are now offered options beyond filmic linear recorded media forms, in modes that are nonlinear, operational, immersive, and *real-time*, and so we might ask how these "do" philosophy in ways that might be either similar or distinct from the filmic. In particular, how do the 3D interactive media systems into which we are sensorially immersed, including gaming devices and softwares, virtual reality or mixed reality interfaces, and motion-capture (mocap) sensors, manifest new or emergent embodied knowledges, thoughts, and feelings in ways that enact novel modes of being-in-the-world? Without intending to reify the old-media-passive/new-media-(inter)active binary, film

is indisputably a medium that captures and represents the world for a cognitively active but corporeally passive spectator, while interactive technologies of virtual embodiment explicitly require movement, activity and agency to activate simulated, rule-governed environments. These simulated models of reality select and virtualize specific aspects of our phenomenological experience of the world, including many, but not all, of our sensory inputs (e.g. sight, balance, proprioception). While to some this might seem like an impoverished illusion of reality due to the fact that there is always a reductive selection of sense data (e.g. of touch, weight, temperature—whilst also losing some of the dense richness of indexical reality that *photogenie* refers to), within the same framework we can also choose to augment and extend selected sensory and *synaesthetic* aspects to reveal a uniquely digital sublime, that, like the cinematic sublime before it, is capable of revealing something new to our cognitive experience. We can consider that the emergence or evolution of a specifically digital embodied philosophy might thus be traced through the diverging degrees of agency and linearity afforded by media-technological development.

In this article I will draw on digital dance practices (dance and movement-based expression in virtual or simulated frameworks, as opposed to just screen dance) as an elemental way of thinking about the new modes of being offered to us in virtual and immersive media. Specifically, I explore embodiment and agency in virtual environments, and more broadly, *corporeal consciousness* as the way that we experience having a body through our kinaesthetic and proprioceptive senses.[1] Drawing from applied research, I try to think through some of the dimensions of an affective (post-)phenomenology of virtually dancing; of moving one's body with expressive intention in immersive, simulated spaces, with and through avatar figures. By doing this, I argue that these practices can extend and augment the sensation of being an embodied human and *relational entity* in the world through a new sensory matrix. Through concepts of "Alien Phenomenology" (Bogost) and "Talismanic Images" (Marks) I largely frame these dimensions of experience through ideals of agency, creativity, becoming, and expansiveness (not dissimilar to Deleuze's cinematic virtual). While I acknowledge that the historical regimes of representation that empower the world view of one group and suppress the perspectives of another endure and are reproduced (re-mediated) through new "volumetric" 3D media technologies

(Pujals), I attempt to make a case for certain practices and aesthetic frameworks that can challenge and dispute these hegemonic regimes. Ultimately, I position digital dance as a potential ethical practice, where one's disposition (mindset or intention) toward the work itself both determines the outcome, and whether or not it can be said to meaningfully "do" philosophy in a creative, critical way.

Working towards a philosophy of *digital* dance in virtual spaces and with avatar bodies entails understanding dance as inherently a form of thinking. Theorists from Suzanne Langer in the 1950s and 1960s to Maxine Sheets-Johnstone and Erin Manning in the twenty-first century have described how dance connects to processes of consciousness in primal ways–learning about one's own body, its vitalities, its capacities for meaningful connection with its environment and other people, and its ways of simulating thoughts and feelings "virtually". The dancer's body is always dynamically caught in a system of real/virtual relationships or interacting forces–between body and physical qualities of space, light and gravity, between body and body, body and music, and between performer and audience experience. For Suzanne Langer, dance is thus always essentially virtual and processual, "an apparition of active powers, a dynamic image", that leads to the expression of a "stream of direct experience, life as it feels to the living" (79). However, when there is a shift in the technological frameworks in which some forms of dance are becoming, we can start to ask how alternate dynamics shift the sensation of connection, communication, intimacy and agency as part of the unique phenomenology, and therefore embodied philosophy, of digital dance.

The Technological Frameworks of Digital Dance

Digital dance can be defined as an emergent system (arisen in the last fifteen years) that introduces a new complexity of technical and interfacial dynamics for choreographic expression. This is a system that allows the capture, alteration, and extension of the expression of human motion and form within mediated environments and complexifies the relationship between performers, and between performer and spectator. With the 2010 hacking of the Xbox Kinect body motion-tracking system (only recently discontinued in 2023) and extending through waves of increasingly affordable sensor-based

inertial mocap and recent markerless AI systems (e.g. Move AI), we have seen an explosion of both amateur and professional motion capture (mocap) dance and performance practice. Alongside recent mocap hardware releases, a range of software is also needed to do this work of re-interpretation of body data–a cluster of real-time rendering games and graphics engines, 3D modeling and rigging software (in which data points are attached to avatar joints), network and telecommunication software protocols (ports, plug-ins, APIs, SDKs, and codecs). Since all of these technological developments have become consumer-accessible, artists have learned that expensive, industry-standard motion capture is not necessary to create expressions of dance movement in virtual spaces. Human movement can be captured as data that can manifest as either image or sound through many different kinds of audiovisual or haptic interfaces. The physical dancer can move in and with the screen image, multiple figures (as avatar representations of motion data) can move with each other within shared virtual spaces, and spectators are able to assume mobile perspectives or indeed participate in the work. All of these agents are enmeshed within a system *ecology* that is determined by the human designer of the system, the software parameters for movement and action within the virtual space, and the hardware's technical affordances (their observable capacities for user action). The combination of human intentions and machine determinisms, automatisms, and affordances yields both potentials and limitations that are complexified through their relationality.

The most immediate and obvious use of the capture of body movement data is to create a realistic *digital twin* or likeness of the actual person who moves, for instance, to monitor and track locomotion for efficiency, accuracy, archiving, and analysis (in sports science applications), or simply to render realistic dance motion on a digital interface for artistic purposes. However, the avatar figures used to articulate captured motion data do not really need to be humanoid, as users are afforded the possibility to move and dance in different bodies, identifying with and projecting one's kinaesthetic sense into a diversity of human and non-human figures on the screen. This process seems to happen almost automatically or intuitively when we are moving identically and in real-time with an avatar figure in front of us (Miller; Strutt and Cisneros). However, in experimental practices that explore the limits of intuitive avatar embodiment, we can see a challenge to realist paradigms of the representation of

body movement, and a blossoming of different animated expressions of motion data ranging from abstract, painterly or geometric patterns to *weird* animal and alien forms. In these practices, I observe a complex aesthetic of dance movement emerging that stretches our ability to recognize the human figure, and a radical reconfiguration of embodiment in sculptural, non-human virtual forms (see for instance the work of artists Remi Molettee, Tobias Gremmler, or the various artists in Alexander Whitley Dance Company's 2021 *Digital Body* project).

The possibilities of going beyond human representation generate a fundamentally different framework for choreographic creation. No longer is the dancer's "tool" the body that they were born with, but now, instead, the body is a controller of, and interface to, a system architecture. This multiplies the creative choices that have to be made for the performance, as Johannes Birringer describes:

> It is crucial to ask where the interactive system is used, on stage, off stage, by the trained performer who is improvising or following a precise cue structure or choreography, by an untrained audience member [...]. The questions extend to who is interacting with whom? With what? Performers with other performers using the interface or performers with the interface or performers with performers within an interface which organises its total output via the actions of the performers? If the notion of choreography is replaced by "user experience", is it because a performative interaction environment has been specifically designed for the user? Who is the user and how does she know what to use? (35)

The traditional phenomenological architecture of separate stage and audience spaces, and the conventional relationship of active performers to the seated spectator is folded such that the performer is a controller, the audience is a participant, and the computer is an active agent in the event of the "dynamic image" (Langer). The task of steering authorial intention through this system is a new field of practice, one in which tried and tested dramaturgical strategies do not necessarily work. New workflows also see the rise of a new kind of practitioner—the dancer technologist—who is not only a choreographic creator and performer, but someone who can learn

new systems, research and develop, technically problem-solve (often hacking and hybridizing), and innovate through iteration. They need to hone, through practice, an awareness of the different experiential spaces of virtual dance that artist Paul Sermon calls the "third space", which, alongside the actual physical space of the dancer, includes layered mediated spaces of representation given by different (virtual) camera angles, screens, and in person or online audiences. Dance theorist Pauline Brooks refers to this as a "virtual interplay" between actual and imagined "territories of performance space" (53).

The performance work then, the dynamic image, becomes more of an interactive installation experience than any conventional linear theatrical presentation. Birringer describes "a shift from *form* to experience [...] dramatically different synaesthetic and kinaesthetic scenarios" (xix). In similar terms, Kriss Ravetto-Biagioli calls it "a complex set of iterations—an indeterminate play of modulation and differentiation producing unexpected affects and relations—rather than discrete and manipulatable events" (4). It is, in effect, an improvisation that is processual rather than formal, such that the open-ended *agency* of the actors within the system space (either performer or audience) becomes more significant than accuracy or fidelity to a fixed concept, inflexible authorial control, or pre-determined form. This open-endedness is, however, not to be understood as an unbridled freedom to create beyond the limits of the real world. New system ecologies often extend or augment *existing* realities, and this means that real-world perceptual and cognitive habits (that are conditioned and ideological) persist, and are built by design into the new systems. In a practical sense, the technological interfaces themselves are often designed with a set of normative assumptions about what a body is, and its capacities for motion—excluding non-normative and disabled bodies in the process. Then, in software and systems design, we can also critique how the parameters of creative decision-making are both shaped and limited by a set of assumptions about what people would want to do in a given scenario.[2] This *creative normativity* becomes deeply embedded in both aesthetic and technical procedural limitations, carrying cultural and ideological baggage into emergent spheres of creation.

Critical Theory

Whilst overall I assume a cautiously optimistic perspective on the creative potential of new dance and performance systems and practices, it is necessary to acknowledge how powerful institutions have shaped how the body is technically captured and reproduced in virtual performance systems. Body tracking and mapping originates in military, surveillance, and bio-scientific applications that present as practices of objective positivistic measurement and classification, and yet carry a legacy of disciplinary regimes of monitoring and regulation that can be described as bio-political in nature. In recent work from 2022, the Possible Bodies Collective's *Volumetric Regimes* project offered a grounded analysis of the technical bases in which this occurs in contemporary 3D and immersive media.

> In *Volumetric Regimes* we find, as a kind of resonance chamber full of case studies, an inventory of techniques used in the context of 3D computing to artificially design *humanness*, referred to as so-called bodies, so-called earth or so-called plants. Mechanisms such as rigging, agential cuts, slicing, dividing, dimensional axes of power, x, y, z, simulated environments, processes of modelling, capturing, rendering, printing and tracking unveil how scientific knowledge incorporated in computational tools is still based on dividing, separating and creating boundaries in a fictional composition of the tangible, in which the world is bounded and organized according to categories of hegemonic fictions. (Pujals 10)

Here, the world, nature, and our bodies are rendered as tangible and real through a set of discourses or "fictions" that are inherently imbued with power hierarchies. In a philosophy of technology—from Heidegger to Stiegler—it is understood that we are produced (enframed) as humans through téchne or technical processes (from the tools we use to language and media) which shape not only our behavior but also our understanding of our place in the world. Addressing the new 3D volumetric technologies, the Possible Bodies collective describe this as an inherently disciplinary regime, a violence and violation of the potential of bodies and their agency.

In a material sense, what is being described through the notion of "volumetric regimes" is that the mechanisms and processes of 3D capture and immersive media production reproduce and preserve normative parameters for potential action. Herein lies a paradox; that so-called interactive or immersive media allow for physically active bodies though they are still rendered discursively "docile".[3] In this perspective, (inter)activity does not equal *agency.* This observation has also been described by several dance theorists—Harmony Bench, Kiri Miller, and Kriss Ravetto-Biagioli—while observing practices of web-based "hyperdance", popular dance-based video games, and multimedia live-dance installation works, respectively. In their analyses of these choreographic works there is a tension between the possibility for bodily action as a "freedom" towards "opening more choices for customizable and unique experiences" (Bench 31), and the sad regularity that despite the proposed interactivity the user often cannot really transform the dance scene in any substantive way. They are, instead, caught in programmed repetitive loops that fall back on conventional representational tropes, and with many interactive or gameplay systems we are merely modulating the formulation of fixed, recorded and linear media—we can tweak its appearance (to us), but we cannot instigate true change. For Bench's analysis of web-based platforms:

> Hyperdances do not offer a place from which the screen-dancers can act, nor do they offer an alternative to spinning one's wheels—they expose bare repetition or repetition of the identical as the core of turn-of-the-century interactivity. (42)

There is thus a clear distinction to be made between *interactivity* as a simple operation or activation, and meaningful *(inter-)agency* as making a substantive change within an environment. We have to ask what kind of interactivity we are dealing with in immersive media frameworks: merely a surface level of choice, or live, processual and fully-embodied activation of difference. The distinction between interactivity and agency cannot be simply mapped over a dichotomy of recorded/pre-rendered versus live/real-time media. We need to look at the underlying computational processes, procedural mechanisms of interaction, and the parameters in which they take place to understand if the mode of action does indeed permit agency,

or whether it forces us to follow a certain repeatable pattern that offers only a semblance of creative decision-making.

In Kiri Miller's analysis of mimetic dance games, although the figures on screen are essentially "playable" in that they invite us to dance with them, they do not lead to "a play of difference" but rather to a predetermined schema (41). The gamified dances of *Just Dance* and *Dance Central* lead to a problematic masquerade of normative gender and race stereotypes through the playable figures onscreen, made all the more potent through the affective immediacy of the embodied dance interaction, that disallows any distance of analysis/reflection. Speaking about Miller's ethnographic research, Kriss Ravetto-Biagioli describes:

> A sense of vicarious play may be part of our attraction to playable bodies and deepfakes, but we (as players) also vicariously open ourselves up to being played, conditioned to accept the terms of play and limited by what can be reconciled between them and the source material. (25)

This points to the very real idea that the systems described above that have the potential to present us with "unexpected affects and relations" (Ravetto-Biagioli) can often actually direct us to very expected, ideological and indeed programmable effects, affects, and modes of embodiment. Responding to this, Ravetto-Biagioli encourages a decisive move away from figurative representation of dance–to deny simple identification and thereby *playability,* instead recommending "a practice of disfiguration carried out by extracting the figure of the dancer from the work or by multiplying the figure to the point that it bleeds into so many iterations that it loses shape" (26). While this might seem fine for extrapolations of dance movement into more abstract fine-art practices, in dance communication the visible presence of an at least quasi-humanoid and recognizable figure with *legible* movement seems imperative. This observation is borne out of the practice-based research of our Goldsmiths Mocap Streamer project; that there is a limit to disfiguration or abstraction practices before the process ceases to serve the dancer's expressive intent, and actually gets in the way of agency or intimate communication between dancers. We have to thus ask, how do we maintain the figure of the dancer in ways that can extend their kinaesthetic

sense of embodiment, while denying simple "playability", and also permitting a kind of productive reflexivity and empowering creative negotiation in the process? In other terms, how can we counter the ideological forces and programming processes of capture and control by offsetting "regimes of the tangible" through tools of creative agency and empowerment, without "losing shape" or losing the dance itself?

Rather than approaching the issue of how immersive and high-immediacy media reproduce ideology only through a conceptual framework of figurative representation and identification (as Miller arguably does with the focus on race and gender stereotypes), or its negation (as does Ravetto-Biagioli), we can instead productively think about the procedures, processes and operations within systems design that either extend or limit agency. Procedural Rhetoric is a concept from games theorist Ian Bogost in his book *Persuasive Games*, which captures the sense of both the Possible Bodies collective's *Volumetric Regimes* and Miller's *Playable Bodies* by articulating an idea of "persuasion" through procedural or operational images such as, but not limited to, video games. Quite simply, persuasion is achieved not through representation, narrative, or speech, but rather through crafting interactions within a simulated environment through which implicit messages are carried, arguments are made, and expressions are constructed. Rather than being explicitly told what the meaning of our activity is, it is woven into the choices and decisions we make to act within the game system parameters—and these processes can influence people's attitudes, opinions, and beliefs. A game might, for instance, convey an anti-capitalist meaning through its gameplay mechanics in our committing to actions that ultimately make us realize that the game is unfairly rigged against us. For Bogost, we would be guided to this persuasive attitude through the interactive options laid out before us. Indeed, this is really classical Althusserian sociology—that ideology is not carried in abstract discourse, but in the "material practices" embedded in everyday procedural interaction, specifically those with institutions (Institutional State Apparatuses), that carry and reproduce the common sense ways of living into which we are interpellated (Althusser, "Thesis II"). This is the procedural rhetoric of everyday life.

For Bogost, however, simulation technologies can also permit productive disruption of the common-sense everyday, presenting us with

alternative spheres of activity that could fold back on and inflect our perception of everyday life. He admits that it can go both ways:

> I would like to advance persuasive games as an alternative whose promise lies on the possibility of using procedural rhetoric to support *or* challenge our understanding of the way things in the world do or should work. Such games can be produced for a variety of purposes, be they entertainment, education, activism or a combination of these and others. (Bogost 59)

Or, for that matter, possibly for oppression? Nonetheless, by exposing and discussing the possible forms of oppression through the procedural rhetorics of new volumetric systems for embodied simulation, gameplay, and performance, we can start to be attentive to the normative assumptions of system design, and maybe even resist them by focusing on the possibility for new actions. This is also the position ultimately taken by the Possible Bodies project:

> Possible Bodies explores … what the imaginary produced within that ontological and epistemological status of computational volumetrics does, and how it intervenes into power relationships. At the same time, they offer us a new imagine-action to rethink previous categorizations, by renaming them. (Pujals 11)

Reflecting on this potential to rethink and rename normative imaginaries, in the following section I draw upon current research to understand some of the more progressive and imaginative possible bodies and interactions that are afforded by the new systems. Although not explicitly educational or activist, I would like to think that in the procedures and operations generated within the affordances of new systems, there is a seed of resistance to dominant ideological regimes—one that could be productively germinated through more widespread and continued practice.

Practice-led Research Findings

In AHRC and British Academy-funded research ongoing since 2020, our research collective at Goldsmiths, University of London has been exploring aspects of digital dance through a series of experiments, residencies, and live showcases that have played with avatar embodiment and motion capture systems and procedures.[4] Called the Mocap Streamer project, we have focussed on inclusive and affordable *telematic* dance practice in *metaverse*-type spaces, which is to say that we have worked primarily with dancers who are in different locations, connected by motion capture data-streaming such that they can meet each other and move together in simulated virtual environments. Our dance partners over this time, Mavin Khoo (Akram Khan Company), Alexander Whitley Dance Company, and Candoco Dance have provided meaningful engagement and critique, and have shaped a research ethos directed not just at digital aesthetics (i.e. how dance data can be *represented* in digital modes), but at questions of meaningful *agency,* communication, and intimacy in the virtual space.

This research has been theorized and published in several articles and book chapters,[5] and the majority of these have focussed on the experience of the dancer more than, for instance, the experience of the audience (on which most recent research into digital performance centers—see Cîrstea & Mutebi). Specifically, in a chapter for the book *Adaptation And Resilience In The Performing Arts* titled "Dancing into the Metaverse: Creating a Framework for Ethical and Ecological Telematic Dance Practice and Performance", some of our dancers' insights were positioned within an understanding of new ethical intimacies in virtual spaces through avatar dance expression, whereby sensitivity and shared intentions allowed for a delicate intersubjectivity to develop between one dancer and a remote digital other. This research leads directly into what follows, framing the digital affordances of representation of an extension of the dancers' virtual interiority through the design of avatar forms and interactions within simulated environments.

Our research asked a simple question, which was how to harness the technical affordances of new technological devices by hacking and hybridizing (i.e. combining or assembling the different capacities that various hardware and software offer for action or use), to create or

enhance a sense of embodied presence between two remote dancers who, wearing motion capture sensors, could control their own avatars in the digital space. If certain physical qualities (we could call these the affordances of the physical dance studio) are taken away from the dancers' reality, namely gravity, the sense of touch, facial expression, eye contact, and even the natural movement of the body (in the sense that sensor-based motion capture often does not effectively capture many nuances of dance movement such as breath, back-arches, or floor work), we asked how we could design virtual interactions through the digital systems that could in some way substitute for these intuitive modes of physical dance practice. We thus experimented with digital effects such as particles (objects within the scene that are controlled and affected by dancers' movement), colliders (that trigger a change based on two avatars coming into contact, textures), and shaders (allowing objects to be reflective, change color, or to have natural gravity-based material qualities).

For avatar design, we experimented with humanoid and animal forms and with varying levels of abstraction, quickly learning that total abstraction in ways that limit the legibility of human movement created difficulty for meaningful dance interaction. It was also felt that recognizable animal and plant forms, albeit humanoid or anthropomorphized, too easily took on a storybook animation quality which while interesting, seemed to limit the dance expression to narrative fabulation. As a consequence of these early experiments, we developed an approach of maintaining a level of abstraction of nonetheless recognizable human forms that had changeable qualities based on the interaction design. These avatars may be seen in some ways alien—with distorted forms or extra extensions—or with physical qualities of liquidity, geometry, gravity, or morphability that are distinctively non-human (See Figure 1).

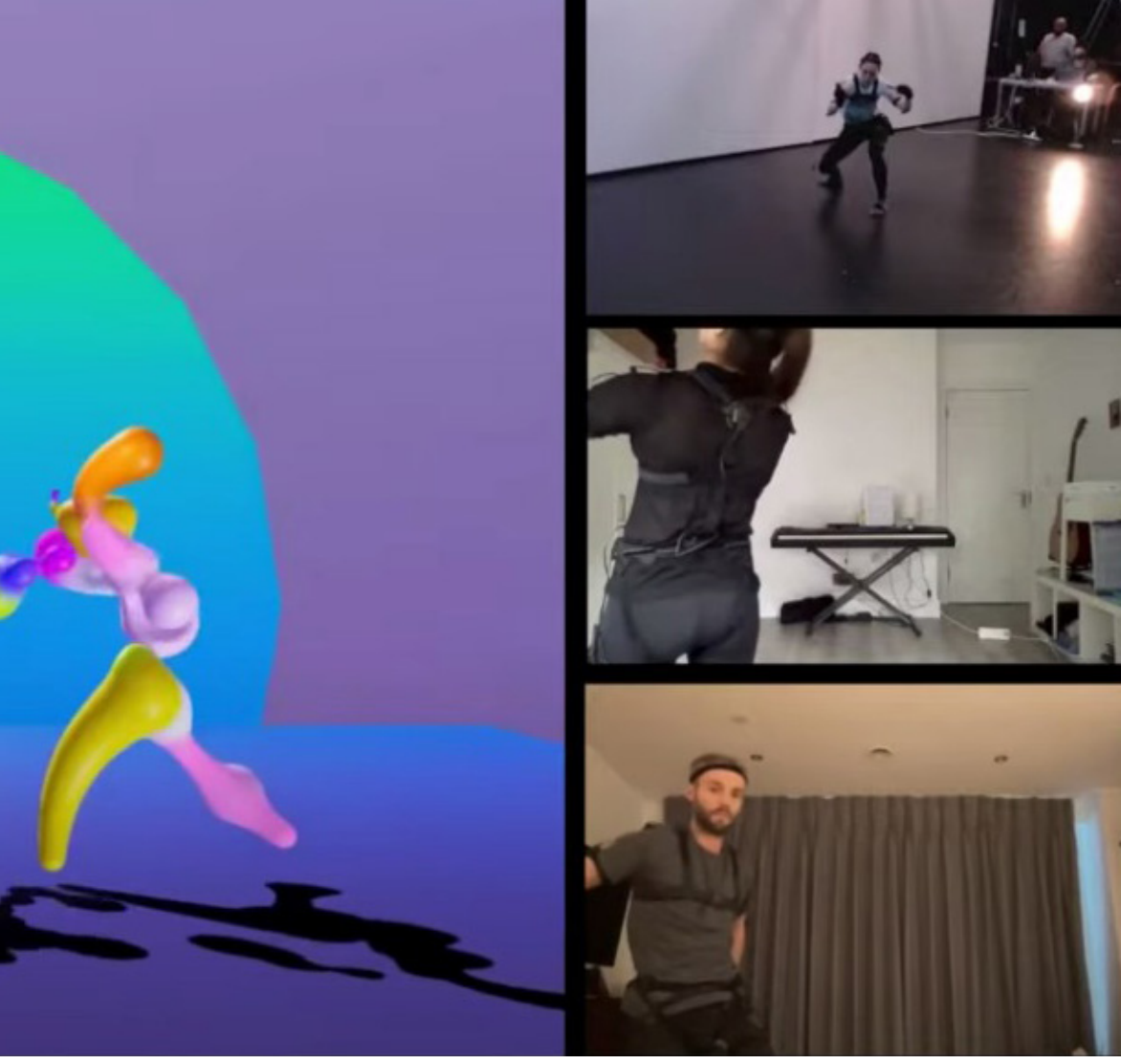
We then explored modes of interaction, and discovered that tightly choreographed work did not speak to the affordances of the networked mocap-streamer system. Dancers would just perform their piece independently, and without direct physical input there was a kind of disconnect where they were not meaningfully responding to each other. Together, we acknowledged that the work needed to be non-linear and at least semi-improvisational if not totally improvisational in nature. In this way dancers would have to be attentive to the screen image, find each other in the virtual space, explore

Figure 1. Participants take part in a movement workshop based around avatar forms generated for the Goldsmiths Mocap Streamer livestream event "Dancing into the Metaverse" in 2021. Two users in London interact with dancer Kristia Morabito in New York. Art Director: Neal Coghlan. © Dan Strutt

the space around each other, and experiment with forms of virtual touch and interaction such as mirroring, trailing, and moving into and through the other dancer (Figure 2). This yielded strong results that felt potent and meaningful to the dancers, albeit forcing them to slow down and in many ways dispense with their conventional choreographic intentions of virtuosity, accuracy, or hyper-activity such that they could gently attune to the other dancer (see Strutt, "A Simple Tool for Remote Real-Time Dance" for a deeper analysis

Figure 2. Dancers Alexander Whitley, Tia May Hockey, and Nicky Henshall explore dance movement in a shared virtual environment and through abstract avatar shapes that could blend and morph. Art Director: Neal Coghlan. © Dan Strutt

of these findings, supported by dancer interview data). What was revealed through this *telematic* framework is that the performance comes to feel less like digital puppetry (where there is a clear ontological distance between the dancer and the avatar) and more like the development of a phenomenologically affective intimacy between the dancers embodying virtual figures.



One avenue of our research, presented at SXSW in 2023 as *Figural Bodies*[6] and drawing on the ethical disability-centred research of Goldsmiths Ph.D. candidate Clarice Hilton, was to workshop these systems using dancers with non-normative bodies or neurodivergence. While findings from this specific work will be reported within Hilton's own theoretical framework, the learnings for the wider Mocap Streamer project seemed to solidify our critical attitude to realist representation in virtual dance interaction. While so much mainstream development within this field is fixed on skin and hair textures, on the fidelity of facial expression and eye contact, and on

microdetails of finger and hand capture, our research has leaned towards the finding that, at least for dance, realist representation is displaced as the main measure of meaning. This takes on particular significance in working with disabled dancers, where the profoundly normative assumptions that are made by tech developers about realistic body shape and locomotion are highlighted. While gestures are currently being made by some developers and creators towards the *representation* of disability in immersive virtual software, especially in social VR such as VRChat through visible prosthetics, mobility and assistive devices (Zhang et al.), very often the underlying algorithms and procedures that calculate captured movement are inherently normative, while the devices and hardware used assume normative capacities for movement (for instance in calibration processes that require a standing subject with arms spread). This denies agency to a large section of potential users within virtual environments, and indeed a user group who might have a particular vested interest in exploring the extended-reality opportunities for embodiment and expression.

Working with non-realist and non-human modes of representation proved productive in collaborations with disabled dancers. Through a series of workshops, avatars were crafted according to their specific need and desire to see their capacities for motion and feeling expressed in meaningful ways. Color, form and texture took on increased importance, and non-humanoid figures were crafted that nonetheless felt deeply connected to the possibilities for expressive motion. Challenging the simple paradigm of representation that says that if we are accurately represented (as we appear in reality) then we can immediately identify, here we see that a non-accurate body image can still yield a strongly affective sense of embodied presence and, moreover, empowered agency. This reflects Anne Rutherford's assertion in the article "Cinema and Embodied Affect" that while body-centered genres of film such as horror and porn provide immediate and obvious affectivity through an excessive "aesthetics of embodiment", we can also easily engage in a more metaphoric, mimetic sensuous relationship to an image that is not a humanoid body, or not a body at all. In her words:

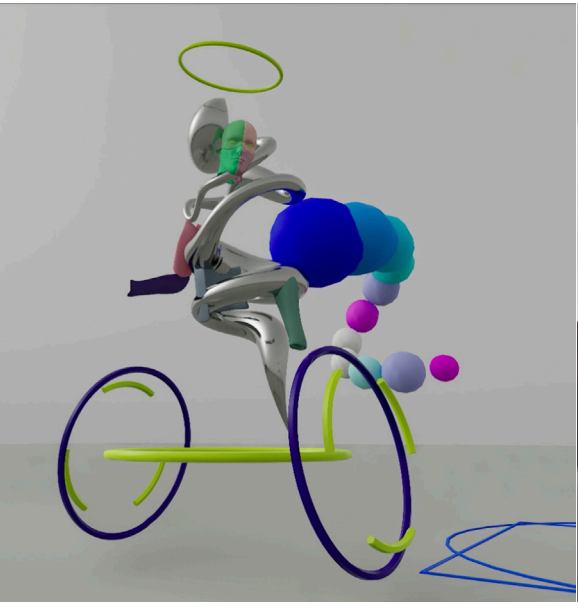
> In a film like *Microcosmos* you may be down there in the mud with the copulating ladybirds—it doesn't mean that

> this is identification, an imaginary mimicry. It may be red-and-black-spottedness, or jiggleness that attracts you, just as in watching an aquarium you may not have an anthropomorphic identification with a fish, but a recognition of floatingness or bubbleness. It may contact some place in yourself that knows weightless suspension and set up a sympathetic vibration with it. Similarly, you may find rollingness in the image of giant wave, spinningness with a windmill, or bristliness with the spiny protuberances on a prickly pear. Shape, colour, texture, protrusions and flourishes all reach out and draw us to them in an affective resonance. (n.p.)

Resituating this sentiment to an immersive media context in which the interaction is procedural and where the body is in actual movement (rather than imagined/cognitively mirrored motion), we can see how this could be an empowering form of dance expression; going beyond representation/identification to exploring affective embodiment through movement, texture and form that is not of our own self-image, and that extends and challenges our kinaesthetic and proprioceptive sense.

For the work *Figural Bodies*, from the Fairmont Congressional Ballroom at SXSW in Austin, Texas, performer and co-creator Kat Hawkins danced with their counterpart Susanna Dye in a London studio, in a shared virtual space and through a variety of insectoid and patterned graphic form, figures and interactions, with a reported sense of intimacy, agency, expansiveness and joy (see Figures 3, 4 and 5). This performance was implicitly disruptive within the context of the festival and in the specific exhibition context dominated by representational XR documentary, narrative, and character-driven experiences. Not positioned as a direct critique of the other work presented, it nonetheless prompted critical discussion about normativity, accessibility and inclusivity that was acknowledged as important by organizers, audiences, and indeed critics/commentators (see for instance Kent Bye's Voices of VR podcast #1195: "Exploring Non-Normative Avatars with Disabled Dancers in "Figural Bodies" Research Project").


FIGURAL BODIES




FIGURAL BODIES
Research that challenges the normative ways the body is understood and represented in immersive technology.
Reimagining fantastical embodiment beyond the humanoid form.
Presented by
Director & Researcher - Clarice Hilton
Director & Designer - Neal Coghlan
Choreographer & Creative Producer - Kat Hawkins
Choreographer & Creative Producer - Suzanna Dye
Sound Design - Ashley Noel-Hirst
Executive Producer - Dan Strutt
SXSW 2023
British Underground
Goldsmiths
UNIVERSITY OF LONDON
Future Art and Culture
2023
candoco dance company
UKRI
Arts and Humanities Research Council
TARGET3D
NOITOM
STUDIO ASZYK
Mocap Streamer

Disability-aware design thinking holds lessons for *all* users and makers of virtual and immersive tech. Following the insights of the Possible Bodies project (and more broadly of both crip and queer theory), realist paradigms of capture and re-presentation are not, in fact, Real, but are imaginations that often passively reproduce hierarchies of inclusion and access based on apparently "common-sense" normative assumptions. These exclusive regimes are imbued in the everyday procedural operations of software and hardware. The problem, then, is at once technical, cultural, and philosophical, at times seemingly insurmountable since it carries the barrage of the whole of human history and (often specifically global-North) ways of being-in-the-world. What *can* be done, however, is to address aspects of design thinking specifically within this burgeoning field of practice of immersive media to afford agency to all potential users. Whilst it is dangerous to suggest that virtual spaces can compensate for, or provide an escape from, a real world of exclusion, oppression and violence, we can say that there are inherent possibilities for agency, intimacy, joy, expansiveness and disruption in the embodiment and experimental exploration of non-human forms. We could, indeed, frame this dance practice in a universal manner as Deleuze and Guattari's full Body-Without-Organs writ large—a virtual body that defies classification, open and porous, and full of potential expansive modes of becoming: "This body without organs is permeated by unformed, unstable matters, by flows in all directions, by free intensities or nomadic singularities, by mad or transitory particles" (40). Through the experimental projection of embodied consciousness into these forms through motion-captured dance procedures and mechanisms, could we start to relinquish the stable, ideological images (imaginaries) of what an organized *normal* body is, to embrace diverse bodies and minds as *dis-organ-ized*?

Figure 3, 4, 5. For 2023's *Figural Bodies,* Kat Hawkins and Susanna Dye of Candoco Dance Company connected remotely from Austin, Texas to London through alien avatar forms. This work was produced as part of the Goldsmiths Mocap Streamer project. Director: Clarice Hilton; Art Director: Neal Coghlan. © Dan Strutt

An Alien Phenomenology of Digital Dance

Moving from material practice back to the theoretical leads to a return to my opening point about these practices "doing" philosophy, by way of noting an optimistic or rather "pharmakological" potential inherent within them (Stiegler). To do this I go to Ian Bogost—wearing his speculative realist hat—and by drawing his methodology of Alien Phenomenology together with the aesthetic and cosmic philosophy of Laura Marks. In doing so, I see interesting parallels develop between their work that suggests that a close attentiveness to the material automatism of both natural and digital systems, alongside a willingness to engage in playful, speculative, and magical, apophenic or metaphorical thinking, can yield new patterns of thought. I suggest that the inherent virtuality of dance that Suzanne Langer described, extended into digital virtual systems, may align with an intention to disrupt modes of habitual thinking and that this can creatively connect perception and feeling with immanent realities full of ethical potential.

I turn to Ian Bogost's notion of "Alien Phenomenology" mainly as a critique of Kantian idealism—the idea that objects are inherently knowable—rather than in his more speculative idea of the "mind" of objects. This idea resonates with our critique of realist representation in immersive media, in as much as metaverse visions often assume a *naïve* model of a knowable reality reified in the perpetuation of sociocultural values such as those of "normal" bodies and identities. Meanwhile, digital media generates a profoundly different relationship to the representation of reality through a set of technical automatisms and their entailed material processes or procedural logics that are totally distinct from the analog. This automatism, for theorists such as David Rodowick, generates images that juxtapose with photographic realism, destabilizing photography's indexical ontology towards a kind of hyperreality.

> The key point of reference now will be to mental events–not physical reality moulded to the imaginary, but the free reign of the imaginary in the creation of images *ex nihilo* that can simulate effects of the physical world (gravity, friction, causation) while also overcoming them. (Rodowick 104)

Rodowick points to the fact that while trying to reproduce a credible reality in immersive media, or a photographic realism in synthetic images, 3D and immersive designers are actively struggling to reproduce anthropocentric "deeply recalcitrant norms of depiction", battling against the "powerful countercurrents that reconfigure these norms" (101). The question is "why?" There is an apparent assumption in the tech industry that we can only experience immersion and presence within a virtual space if its representation directly mimics our experience of external reality. Our practice-led dance research challenges this, as agency—the power to meaningfully act and interact—overcomes identical representation as the measure of feelings of embodiment.

Bogost intervenes here in interesting ways possibly because he has a background in video game design. He proposes a set of speculative, practical, yet playful methods for getting out of an anthropocentric view of reality. His focus is objects and things in the real world, as by focusing on them he engages in an ontological exercise of actively trying to decenter a priori knowledge about them, destabilizing habitual perception, and revealing new understanding of things. Everything, in fact, is revealed as "alien" and in speculating about their inner existence a new poetics of reality can occur, dwelling in immanent and dense complexities of Being, and towards a new kind of humility (121). To do this, he offers a philosophical practice of crafting or assembling things that he calls *carpentry*—"constructing artifacts that do philosophy" —that instead of putting into words, crafts meaning through things. Knowing resides in doing, not just thinking or writing about, and carpentry contends with "material resistance of a chosen form", i.e. the force or automatism of a thing that acts as a "countercurrent" against our creative intention. It is a very broad concept of making: "To do carpentry is to make anything, but to make it in earnest, with one's own hands, like a cabinetmaker"; Bogost himself notes that it seems like a fairly absurd idea, even when done with the practice of philosophy in mind.

> It might seem silly to talk about making things as if it's a new idea. Designers, engineers, artists, and other folks make things all the time. But philosophers don't; they only make books like this one. (99)

So to engage in *philosophical* carpentry is to attempt "to capture and characterize an experience it can never fully understand, offering a rendering satisfactory enough to allow the artifact's operator to gain some insight into an alien thing's experience" (100).

Perhaps counterintuitively, software programming is one method that is offered as carpentry, and in fact this is Bogost's primary example, given his own track record in making videogames. He describes how a piece of software can be designed to disrupt and break down internal processes and reveal it in a different way. It can essentially open the black box of computation and make us contemplate "the internal experiences of withdrawn units" (105). Extrapolating this to actual wood carving, we can imagine a knot within the wood that was a reaction to an experience that the tree had, and yet that experience is locked within the tree. Through carpentry, we discover a material resistance to our understanding of the object, within the knot, and we discover a new perspective. Of course, a knot in a tree, like a glitch in code, is perceived by human instrumental thinking to be a fault, and yet through an alien phenomenology it can also be understood as an experience that the thing had, and we can attempt to appreciate it through metaphor—what it was "like" for the tree/software to experience that event. This is what Bogost calls a "weird realism" (109).

This leads us to another *alien* method that Bogost offers that seems relevant—*metaphorism*—a technique of creative distortion for revealing how objects might perceive and experience. This is a truly imaginative practice—a thought experiment where we engage in "speculating about the unknowable inner lives of units" (61). He notes that this methodology is distinct from "representational metaphor" which would suggest using metaphor to explain and/or solidify meaning through likeness (i.e. *molecules are just like lego bricks*), instead saying that these metaphors should distort and "break with some of our own modes of knowing" (67). Bogost offers what he calls the "clarity of distortion" as "we never understand the alien experience, we only ever reach for it metaphorically" (66). Referring back to Suzanne Langer and her conception of the "virtual powers" of dance, we can see that choreography is inherently a form of *kinaesthetic metaphorism*; where metaphors of emotion, objects and forces are crafted through the body's capacity for expression. There is something specific about dance's ambiguous abstraction of

affect that permits a richness and density of metaphoric interpretation. As an example of this, and seemingly channelling Bogost's absurdism, international science students are invited to "Dance your PhD" in an annual contest (now in its sixteenth year) (Ouellette). While this may seem like a whimsical exercise, it interestingly illustrates how complex ideas about force and substance can be evocatively interpreted through body movement expression and kinaesthetic metaphor, encouraging new modes of thinking about and representing abstract principles.

Following the principles of a distorting yet revealing metaphoric relationship, I see the potential of situating our digital dance research within the conceptualization and methodology of alien phenomenology. The philosophical proposition made through this positioning in theory is that in the experience of moving in different bodies, distorted forms, and through de-realized or non-human manifestations of force, intention and agency, we might think metaphorically, in de-anthropomorphizing ways, about secret intimacies with things. We can speculate what it is like to be an insect or an amoeba, interacting with a river stream, and how they experience each other (though this selection of agents is perhaps already too tangible and suggestive of narrative). This is perhaps all the more powerful because this form of speculation in the form of dance is not merely a thought experiment, but rather embodied acts of crafting/carpentry in an alien space. For the dancer, this is the making of a dynamic image, not "with one's own hands" (assuming the dancer has hands at all) but with the capacities of motion of a total body; for the developer-technologist it is the stitching together of base-meshes, particles, colliders and textures as if sculpting a material. Framing this work through notions of carpentry and metaphorism may indeed assist in an iterative, collaborative creative process with a tacit acknowledgment that dancers and digital artists are *both* creative technologists capable of "virtual" metaphoric thinking. A deliberate and strategic estrangement towards taken-for-granted things (like a normative body) and the disruption and re-interpretation of the cultural structures in which our own body is enframed can be intentionally developed with a collaborative willingness to challenge disciplinary knowledges.[7]

Talisman Images and Cosmic Connection

Finally, I turn to the work of media philosopher Laura Marks. More than a *speculative* realism of the secret lives of things and objects, Marks offers a kind of metaphysical *realism* that nonetheless resonates with Bogost's often absurdist critique of idealism and anthropocentrism. What it offers to digital dance research is a way of thinking beyond images as mere representation, or as only modes of imaginative thinking, and instead positions them as entities that enact real difference in the world. In her book chapter "Enfolding-unfolding aesthetics, or the unthought at the heart of wood", she applies a Deleuzian/Liebnizian lens to describe a way of experiencing the world that is similar to Bogost's notion of carpentry—an aesthetic mode of affording agency to both image makers and the images themselves. For Marks, aesthetics describe "how we engage with the world" or more precisely with images: "by image I mean not only the visible, but all that is perceptible: visual, audible, tactile, olfactory, etc." (152). Actual images are extracted from the infinite virtual through what she calls "calculations" or "procedures", which *unfold* immanent information into specific forms that are cognizable—our own perceptions, but also material things and objects: "photographs, brushstrokes, and iconic images". Images are therefore always technical, dependent on processes and interfaces (both technological and cognitive) that organize noise into signal. These are, for Marks, aesthetic processes rendered technical, that determine what images are unfolded and what stay enfolded. She describes:

> Enfolding-unfolding aesthetics is useful for critical thinking: what is deemed useful information, what is forgotten as mere matter? What continues to be taken up, to generate new signs as it circulates? (153)

Of course, usually what we carve out as images and things is determined by very normative anthropomorphic frameworks. Reflected in the position of the Possible Bodies collective given above, Henri Bergson tells us that things exist unto us as far as we can use them, act upon them, or organize them into categories such that we can know them—he calls this the "poverty of perception" (38). Nonetheless, we can also, with an effort of will, instinctively engage in metaphorism to get beyond this utilitarian aesthetics, and to think

about the dense, infinite immanence of things and substances—such as wood.

> We humans are not so different from the things we think about, and that is why we are able to think alongside them. That's why we can anticipate their reactions: from massaging a dog based on where you think it might ache, to sectioning the muscles of a slaughtered animal, to responding mimetically to a potato plant infested with bugs, and calling on our plant nature to find a way to cure it... This response to the world, according to Bergson, is instinct: what we have in common with animals and plants. So, when we get in touch with the heart of wood, we are using our instinct to call on our internal cellulose-like nature. (Marks, "Enfolding-Unfolding Aesthetics" 156-157)

Carpentry for Marks does not engage in *speculative* thinking, but rather it weaves a real connection between the wood within us, and the us in wood. Like carving form out of wood, mediation—that is, making images—does not simply represent the world, it weaves connection and unfolds the relations between objects and things:

> Mediation does not destroy nature but is part of it; it is an extra set of folds, a surface complication, codifying and altering nature, and contributing its own materiality. (159)

There is a processual intersubjectivity between human and thing suggested here by Marks that allows us to potentially explore (or unfold) aspects of reality beyond the representational, naïve realism "that has been unfolded for us". This involves the materiality of objects, and the "agency of non-human perception, and also non-animal, organic perception, and even the perception of non-organic entities" (160). This observation, running from Bergson through Deleuze and Guattari and to Marks, tells us: "it is a question of surrendering to the wood, then following where it leads" (157). This seems complementary to Bogost's alien phenomenology of speculative experimentation, and indeed, to the above-proposed methodologies of digital dance practice.

In more recent work drawing on Persian and Arabic ontologies of representation, Marks extends these concepts around mediation to a specific type of intentionally ethical image that she calls a "talisman-image", which, by design, acts to unfold the infinite in specific ways.

> A very few works make an affective fold that reaches all the way from the cosmos to your body, through delicate and risky processes of contact, correspondence, sympathy, and passion. ("Talisman-images", 253)

She draws upon a magical/mystical metaphor to elaborate a genealogical approach to a type of talismanic images that have been specifically crafted, carved, embossed, woven, or *coded* for the explicit purpose of effecting a change in the world through the harnessing of "cosmic" energies. These aesthetic images, throughout history, have been diagrams of the stars, animals, object and things, abstract and algorithmic patterns, presented in ways that cultivate "the interrelatedness of things … making themselves microcosm of the universe" (232). Rather than simply *following where the wood leads,* these intentional images try to harness the energies of cosmic connection, between the cosmos within us, and its continuity with the infinite.

Bringing these concept back to dance research, I articulate a wilfully optimistic perspective about new immersive technologies as potentially talismanic images. While it is clear that these systems have parameters and limitations and do not afford total freedom, they do permit a style of embodied agency within the materiality of the digital that aligns with an intention to weave affective connections through an intentional *unfolding*. This is experienced by the dancer/user themselves, in their own words, as full of potential, as Tia May Hockey remarked in an interview as participant of the work *Virtual Touch, Virtual Dance* in 2021:

> There were definitely some out-of-body experiences and moments where I felt the potential of the virtual connection with the other performers. It required me to fully engage with my imagination and to let the reality around me disappear in order to let my attention be fully present in the

virtual space. (quoted in "A Simple Tool for Remote Real-Time Dance Interaction in Virtual Spaces")

Digital tools can remove obstacles to metaphoric thinking and the mimetic imagination through the simulation of the impossible. With intention, we can attempt to collaboratively craft or *carpenter* multisensory, embodied and operational images, and to create *procedural rhetorics* that are designed to augment non-representational thinking and fracture normative perception. As a talismanic image, this may feel creative, expansive and joyful; moreover, it is, through the lens of an alien phenomenology, also engaged in the work of cultivating ourselves as a microcosm—an inherently ethical (if not magical) process.

Conclusion

Immersive tools and interfaces, interactive design processes, procedural logics, and digital aesthetics can, I suggest, help us unfold alien phenomenologies and weave connections between objects and things that decenter the human experience (anthropocentric), while revealing something different about us as relational beings. Together, the new systems of creation have the potential to unfold new affects, perceptions and concepts, and thus new ways of being in plural, porous, and diverse bodies-without-organs, even if only for the duration of the dance. However, this is not as simple as just jumping in, as these systems can easily carry with them unquestioned normative assumptions and ideological legacies of surveillance and control. While entering the phenomenological space of digital dance can indeed be immediate and instinctual, to do it critically and mindfully requires "activation" —an effort of will. As Marks describes: "…unfolding requires a certain *force*, a desire to bring something into actuality. Some things resist unfolding" ("Unfolding-Enfolding Aesthetics", 153–my emphasis). We can perhaps think of the "force" that Marks' here describes as an effort of positive creative intention that must be leveraged against the ideological structures of categorization in volumetric regimes.

In this vein, both Bogost and Marks offer a prerequisite to their respective "alien" and "talismanic" processes. For Bogost, this is

captured by the concept of *wonder*, whereby we cannot just simply and easily engage in alien phenomenology without doing the groundwork of dismantling prior knowledge.

> The act of wonder invites a detachment from ordinary logics, of which human logics are but one example. This is a necessary act in the method of alien phenomenology. As Howard Parsons puts it, wonder "suggests a breach in the membrane of awareness, a sudden opening in a man's system of established and expected meanings". To wonder is to suspend all trust in one's own logics, be they religion, science, philosophy, custom, or opinion, and to become subsumed entirely in the uniqueness of an object's native logics—flour granule, firearm, civil justice system, longship, fondant. (*Alien Phenomenology*, 124)

For Marks, this groundwork also needs to be done and is captured through notions of *ceremony* or *ritual*—the work of setting intention, clearing space, and preparing the affective body before invoking the "irrational cut into the perceptible world that may be able to discover primordial bodies, or bodies yet to come" ("Talismanic Images" 252). In past mystical practices, this involved "performance, mimesis, incense and disorientation" (251) through disciplined or devotional practices such as fasting, chanting, ritual preparing of materials, or performing repetitive actions to increase focus and place the body in the correct somatic disposition. While we all may have our little rituals before engaging in acts of creation, there is an added layer of *faith* that she calls upon before activating the talisman. Drawing on Persian philosopher Al-Kindí, Marks describes that "the operator and the recipient of image magic must have focus and right intention, and the magician must have imagination, desire and confidence/faith (*fides*)" (250). Of course, this does not have to be magical, and in many ways, this is the normal "virtual" practice of the performer who has to mentally and physically prepare to enter into the "phenomenological space" of the dance (see "Interview with Hubert Godard"). Similarly, with motion capture there is an almost ritual process of calibration before entering the virtual space, by suiting up with sensors or markers and going through a sequence of poses. Only then does the avatar figure snap into shape and take on the identity of the dancer (or is it vice versa?).

What these activation rituals do is suspend normative perception/recognition, and engage imagination and wonder before creative action. There is a decisive difference, however, between cultivating this specific disposition in embodied, interactive, and immersive media, and doing the same with "old" media that is consumed with a more-or-less immobile body. While with film we do of course still engage both imagination and embodied simulation processes, there are valid concerns over our unobstructed processes of identification with continuity-style media representation that endure today (from Apparatus Theory onwards). Although no longer framed through the simplistic dualism of active vs passive spectatorship, the reproduction of ideology in mainstream media is real, well-documented, and manifold in its techniques. Nonetheless, thinking about the affordances of embodied media *only* within this same regime of representation/identification leads both producers and critics down a narrow path of a politics of difference—where digitalization (capture) feels like appropriation, and simulation is seen as artifice. Through this lens, we will always have an impotent *playability,* or docility, without the agency to instigate substantive change.

However, thinking phenomenologically and through aesthetic frameworks that see images as portals rather than reflections, we can start to see a reconfiguration or extension of what is considered to be embodied expression. Through virtual and telematic dance movement experimentation we can see that this is not some transhumanist dream of escape from the flesh, but rather extended and transformed sensations of embodiment that occur *with others* in shared digital environments. Motion capture alongside XR technologies can, if designed correctly and for all users, afford agency to craft (or unfold) ethical intimacies between distant subjects—not through the instrumentality of "playable bodies" but through a non-human aesthetic and speculative metaphoric exploration. It also has the potential to resist normative perception, challenging the naïve representational regimes of realism that are both destructive, exclusionary, and oppressive. In this way, we can start to think about digital dance performance as being a practice of (un)doing philosophy.

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Notes

1 This type of work is also done in recent philosophy work such as *Reality+* by David Chalmers, or by Metzinger, but without any specific mention of dance.

2 As an example of this, most motion algorithms in inertial sensor motion capture (where poses are estimated or interpolated from abstract sensor data) are trained on walking, running, jumping or fighting movements, with normal gameplay style movement in mind. Dance, in its greater complexity, often "breaks" the algorithm, for instance with long jumps, floorwork, or back bends that the system cannot recognize, and tries to correct in often unusual ways.

3 For Foucault, *docility* occurs when a group of people are so used to being watched continuously that their discipline becomes internalized and they no longer have the capacity to resist ("Discipline and Punish"). When people enter into this state, they become docile bodies. Through Eugene Thacker's analysis the codification of the body is a form of biopolitical discipline "the relation between discourse/language and the body/materiality is one of docility, a "technology" of bodily production. Change the code, and you change (render docile) the body hardwired as that code" (6).

4 The core research collective included dancer and technologist Clemence Debaig, 3D artist Neal Coghlan, creative technologist Clarice Hilton, and developer Paper Plane Software–see mocapstreamer.live.

5 Strutt and Cisneros, Strutt et al., "Motion Capture, Kinetic Synaesthesia and the Digital Aesthetic", "A Simple Tool for Remote Real-Time Dance Interaction in Virtual Spaces".

6 "Figural" here refers to Deleuze's formulation of the *figural* as opposed to the *figurative* in his "Francis Bacon, the Logic of Sense".

7 Dancer Tia May Hockey described this intention: "When I had a shared intention to play with in improvisation with another performer, I felt moments of connection with our virtual characters and through to my being. It's kind of like the connection you make with an animal and you both know that you're watching each other, there's a level of sensitivity required by both parties to listen, anticipate, predict, and respond. It was hard to maintain this sensitivity, but I did experience flashes of it" (Strutt, "Dancing into the Metaverse").