

DANCING IN SUITS: A PERFORMER'S PERSPECTIVE ON THE COLLABORATIVE EXCHANGE BETWEEN SELF, BODY, MOTION CAPTURE, ANIMATION AND AUDIENCE.

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Abstract

The motion capture process places unique demands on performers. The impact of this process on the simultaneously artistic/somatic nature of dance practice is profound. This paper explores, from a performer's perspective, how the process of performing in an optical motion capture system can impact and limit, but also expand and reconfigure a dancer's somatic practice. This paper argues that working within motion capture processes affects not only the immediate contexts of capture and interactive performance, but also sets up a dialogue between dance practices within and beyond the motion capture studio.

Keywords: dance, motion capture, interactive performance, somatic practices.

Motion capture has emerged over the last ten years as a technology that offers new possibilities for dance analysis and for choreographic creation. Motion capture analysis has been used in biomechanical studies of dance technique and style [1, 2, 3, 4] and to develop dance technology performance works [5, 6]. Dance researcher Sarah Whatley has developed a number of projects that seek to embed somatic, dance-based information within digitized environments. Whatley emphasizes the importance of taking into account the somatic nature and requirements of specific dance practices when developing motion capture projects, [7, 8] in discussing digital artist Ruth Gibson's use of motion capture to investigate Skinner Release Technique.

Optical motion capture systems use markers attached to the dancer's body, either by means of a Velcro suit or by attaching markers directly onto skin using sports tape and surgical tabs. Inherent in this process, and in the technology itself, is a mapping of the body's movement to lines of action in space that are defined by the movement of the markers rather than of the body itself. A dual shift in somatic awareness is involved here. Firstly, the dancer's

experience of moving is re-constituted within the physical sensation of wearing markers and/or a suit. Secondly, the dancer's movement is re-formulated in terms of a series of lines in space, rather than as a volumetric 'body' moving through an environment.

This paper seeks to examine and articulate the ways in which these shifts in embodied experience can be understood in the somatic, aesthetic and artistic context of dance practice. We argue, based on the experimental work described below, that these shifts can only be understood in terms of a two-way process between a dancer's practice inside and outside motion capture systems. That is to say, the 'effect' of motion capture on dance is not uniform or pre-determined by the nature of the technology so much as it is constituted in and by the somatic/artistic practices of an individual artist.

This discussion arises from a series of experiences, projects and conversations arising from the work of the Deakin Motion.Lab over the last three years. The authors have worked together, and with the creative team at Motion.Lab [9], on numerous projects in dance analysis and transmedia performance, Hutchison as performer/creator and Vincs as director/researcher. In the first instance, the investigation into the experience of dancing in suits was not an explicit goal, but arose from ongoing conversations that took place in and out of the studio as we worked together across a range of projects and creative and research contexts. The relationship that exists and is articulated in these few pages gives voice to our ongoing discussion about the nature of performing 'in suits' and what that might mean for a dancer's practice both in and outside of a suited environment.

An implicit contract

Hutchison provides a first person description of approaching a motion capture shoot.

Seeing yourself as a cloud of markers when you first walk into a motion capture volume is always strangely exhilarating and exciting, but also an experience of vulnerability. It doesn't matter how many times I have donned a suit now, it's still the same feeling. There is a sense that anything is possible and the opportunity to test what that might mean is fuelled by the adrenalized feeling of a performance. Whether

the situation is a data capture or simply an exploration of a new process, I feel it is a performance from the moment I put on the suit. I find this the case even in processes that are explicitly provisional and exploratory, and hence more about testing, buffering, adjusting, negotiating, aligning, familiarizing for the system, and not really about how one usually understands performance. 'Performance' is what I feel from the moment I step into the suit. With performance comes a sense of openness and possibility, but also of exposure and vulnerability.

This vulnerability arises from the process of exchange we know will present itself as part of the task in hand. Whether this task is recording movement data to be later mapped onto a CG figure, or testing and performing interactive motion-driven visualization, an openness to admitting movement modalities, qualities, textures and sensations simultaneously from sources inside and outside the dancer will be integral to the process.

Perhaps the most vivid evocation of this sensation occurs when working with artificial intelligence systems. Working with Motion.Lab interactive artist John McCormick, Hutchison improvises with an avatar generated by a neural network system created by McCormick. The system is trained on Hutchison's movement data and attempts to respond to her movement rather than copy it [10]. In this system the exchange with technology is composed not simply in terms of texture, surface or trajectory, but in terms of movement constituted via a hierarchical skeletal (joint-driven) model. Thus the terms of the exchange are enacted through humanoid morphology, with Hutchison's movement placed in dialogue with the avatar's seemingly humanoid movement.

The way in which Hutchison constructs her part of the exchange can only be fully understood in terms of her practice outside of and prior to her work in motion capture. Hutchison's understanding of hybridity, drawn from her solo performance practice, marks and defines her approach in very specific ways. Hutchison describes her solo practice, again in the first person to capture the embodied nature of the work as closely as possible, as follows.

Away from my work in a motion capture suit, I experiment with the collaborative and artistic potential

between contemporary dance, circus arts and improvisation, and the selves that the specific bodily practices brought about through the practice of these physicalities. I experience myself, through these practices, as multiple, a hybrid body.

When I describe myself and my work as hybrid, I am seeking to articulate a practice, performance and self that is not one, not singular or discrete in its aesthetic, physicality or philosophy. This hybrid is a mesh of intertwining strands of practices, experience, memory, imagination and consciousness, which are constantly weaving and re-weaving tensile, interconnected threads. Rather than viewing hybridity, the hybrid body, as a negative construction brought about through a pastiche of poorly understood practices, I view hybridity as a positive and expansive practice, process and philosophy. Hybridity involves, for me, a fluid dynamic relationship across art forms and the ability to collaborate widely.

Dance theorist Laurence Louppe, who understands dance as a means of constructing an embodied subjectivity which is developed over years of practice and therefore not quickly or easily malleable, states that, “In today’s dance, both the demands made by choreography and the structure of dancers’ training inscribe hybridization in the destiny of the body. As a result, it is virtually impossible to develop recognizable zones of corporeal experience, or to construct the subject through a given corporeal practice” [11]. Louppe’s view is that hybridization works against the development of a distinctive corporeality. Hutchison seeks the opposite. Her project, as a dance artist, has been to find within the hybrid practices in which she has trained strategies for repurposing cultural, artistic and corporeal elements of these practices to create a recognizable and distinctive subjectivity. Unlike the great moderns, such as Martha Graham, Merce Cunningham and Isadora Duncan, who were interested in refining cohesive and distinctive dance practices based in their own bodies, Hutchison seeks to find cohesion through integrating diverse, and even contradictory, practices within her body.

We question whether hybridization, which is, as Louppe argues, inevitable

for this generation of dancers on the basis of their immersion in a project-based dance industry, is necessarily problematic. Within a historical context of ubiquitous cross-modality, it is perhaps more useful to seek the possibilities within hybridity than to simply assume hybridity to be the enemy of distinctiveness.

Hutchison works with the specific bodily practices of tumbling, tissu, corde lisse, improvisation, contemporary dance phrase material, ballet and running in her examination of hybrid processes. By separating these practices out she investigates the precise nuances of the body in each form as distinct and exclusive processes. In developing performance, she takes her cue from Deborah Hay and generates an improvised practice that recognizes all potentialities at once by engaging multiple bodies, multiple practices, and the interstitial spaces that open up between them. Hay’s practice “constructs body as a site of exploration to which the dancer must remain vigilantly attentive. Body does not succumb to the dancer’s agency – striving, failing, mustering its sources to try again. Instead it playfully engages, willing to take on new projects and reveal new configurations of itself with unlimited resourcefulness” [12]. Hay’s practice creates space for experimentation with all possibilities for dance at once, and values “the body as a generative source of ideas” [13] – in this instance augmented by the technologized environment rather than by a written or verbal score.

Each practice inscribes my body in precise and specific ways. In performance, the borders are torn, all possibilities are actively in flux and permeable.

Hybridity is fundamentally a process of respect. Working with hybrid practices involves a care for the nuance, context and history of each individual practice, and a diligence about resisting the easy solution of allowing one to dominate or subsume the others. This process is precisely analogous to that of working with another dancer. The enactment of this approach in motion capture work has come, over a period of years, to be encapsulated in a ritual articulated as follows.

While changing into motion capture suit and attaching the markers (which I often do myself as it seems

quicker and easier), I make an implicit agreement to respect my ‘dance partners’. In a motion capture context, my ‘dance partners’ are not usually other dancers or even other practices, as is the case in my work outside the motion capture studio. My dance partners in motion capture are markers, animations, motion graphics, avatars and the spatial reality of the motion capture volume.

The ability to work in this environment, to perform with a giant animation on a screen, for example, does not mean making myself larger, more dynamic, or more present as if to compete with the sometimes overwhelming scale of a visualized graphic. On the contrary, to work successfully in this environment, I need to be more vulnerable in the sense of allowing myself to be really seen and to be responsive and open to whatever comes in to the space from all of the potential collaborators (human and technological) present at any given moment. To engage with human and non-human collaborators requires an openness to possibility that is the opposite of ‘technique’ in the sense of previously mastered movement capacities.

As anybody who has ever danced a contact improvisation duet with a partner knows, reciprocity and sensitivity is needed rather than force and the assertion of a pre-defined intention. The experience of working with motion capture environments is that I cannot be concerned only for my own enjoyment and/or ability as a dancer. I need to foster an implicit, moment-by-moment negotiation with all ‘partners’. Remaining open to any and all potentialities at once is what makes the initial testing or experiment phase really powerful and exciting.

The moment when performer and director see the marker-data cloud demands an acknowledgement of a new contract or relationship for the day ahead. The contract is really an unspoken agreement to find ways to test and challenge but also to be highly respectful of one’s dance ‘partner/s’ – the markers attached to the performer’s body and the cameras seeking their presence.

A very tangible example of this interconnectedness is the approach to movement motion capture requires. In an optical motion capture system, marker occlusion is a constant problem. Because optical motion capture works on line-of-sight, if markers are occluded by body or floor, the data becomes more difficult to process. Hutchison has developed, in response, a subtle but effective approach to moving in ways that minimize occlusions while maintaining a rich movement exploration process.

Investigation and experimentation

Choreographic investigation implies cultivating constant embodied shifts and changes that produce new nuances in the body. In the suit these are more pronounced because of the heightened state of awareness necessitated by the environment. There is a need to be aware of relationships to the screen and to others in the space, and responsibilities to maintain the markers in sight of the cameras and to not roll around on the floor or over-bend in the hips to maintain the integrity of the data-stream. There is also, and perhaps more critically, the need to generate movement that is readable in relation to the screen. That is to say, the geometry of the image must be activated in ways that are consistent with 'its' spatial and temporal parameters. To do this, it is necessary to test the properties of the graphics or avatar that might be up on the screen, and to explore and challenge how it works and what moves it and in turn how this moves the performance itself and how others perceive it.

There are a lot of balls flying around and my attention therefore seems intensely focused, perceptive and responsive. In this environment I am less concerned than I might otherwise be in dancing "for" myself and more concerned with the feedback I am receiving. The feedback is multiple and instantaneous. It is coming from different perspectives – other dancers, directors, the animation, the animators, programmers and myself. What is really important in this environment is listening. It is listening with your body as you do in other forms of dance improvisation but it goes beyond this and takes you into more of the role of facilitator and guide. Responses to particular movement of my body and what this

does up on the screen really creates my score and landscape within which to keep working.

Different graphical and avatar environments require different 'orders' of physical control. An amorphous avatar based on a cloth simulation, for example, which has the implied weight and mass of a woman's torso but no limbs to provide stability, extended movement or even the ability to stand or walk, requires very fine motor control through the dancer's torso. Less is more, with regards to the dancer's physicality, because slight shifts within the dancer's core axis create large ramifications for the avatar/figure's whole mass. Conversely, a series of trails that mark specific marker trajectories have an easy motility that requires constant movement through large arcs created by the dancer's extremities to create effect. The dancer's literal, physical presence is, in both cases, mediatized and re-presented on screen in the form of avatar/figure/motion graphics that form an extended sense of 'presence' within and through the generated imagery. In the first example, the dancer's screen 'presence,' both physical and mediatized since both are visible in the space simultaneously, is linked to the axial skeleton, to posture and its subtle shifts which in turn animate the figure. In the second example, presence is mapped by arcs through space that must be constantly replenished since they fade quickly, erasing all sign of the performance that was.

I am working with curiosity as to what this version of myself is. I'm watching quite closely on the screen to see the motion, particularly at my joints. It's a playful exchange of pushing boundaries. Really small fine movement and larger more dynamic movement edging towards the floor and perimeter of capture volume mark out territory in a way but also tune my body to my virtual body and space.

Tension and intention

Both within and outside of a suit, the practice of weaving together multiple perspectives of movement, physicality, expression and collaboration across art forms and artists involves grappling with tension. Tension arises through holding on to many multiple threads at once and creating from these threads in the moment of performance. The acuity of

the tension from moment to moment must be sharp or focused so as to be clearly articulated and interpreted. In this way the intention is always pointed, focused on drawing precise action out of an 'in-between' of multiple artistic, technological and movement information dialogues. Success means achieving a dialogue between all parties. Failure means incoherency and 'noise'.

The tension created through the awareness of what you're working with at any given moment has a focusing effect. It means one must attune to what is urgent at that moment – perhaps to the juggling ball that is in the most danger of being dropped, or perhaps to the ball that offers the most potential, or draws the most audible comments or sharp intakes of breath from the inevitable group of artist/researchers/observers watching the process.

Each animation, each marker or group of markers being used to drive the animation provides the opportunity to interrogate my body, to ask how with these particular constraints, these references to draw on, and as formed in response to the collaborators and audience present in the space, might I move.

Conclusion

Other than performing in the round there is no other performance environment that acutely sharpens one's attention to 360 degrees, to the whole body at once. A heightened state of awareness is induced by wearing a suit covered in markers, and having one's every move recorded, amplified, projected and mediated by a visual representation that can range from the most abstract points and lines to the most realistic of humanoid characters. This process affects a profound influence on embodied practice that simultaneously invites attention to the possibilities of the body and possibilities beyond the body. In this way, we see the motion capture process as inherently generative for dance practice in and of itself, aside from any of its more instrumental uses in dance analysis and creation. It may, in fact, be precisely this ability to call attention to the experience of one's body that underpins its effectiveness in enabling processes of dance analysis and hybrid, trans-media creation, because this attention focuses not only the process at hand, but also the individual dance practices that are brought to it.

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