

After Choreography

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Although the notion of choreography has not disappeared in the context of contemporary twenty-first century digital performance and virtual art, it has undergone a re-evaluation in terms of how bodily movement produces data or how a performer or 'immersant' engages with an interface environment that is programmable and networked, and thus open to unpredictable and emergent states. These states evolve from the system behaviour as a whole, from the digital body-environment interaction.

For many artists working with computational and interactive systems, models of *real-time* sequencing and intervention in image and sound projection have become vital, and these are often derived from mathematics, cybernetics, biology, neuroscience and AI rather than from a primarily notational understanding of 'choreography' (the writing of dance) based on principles of organizing movement in space and time. The category of *real-time* is introduced through computational and algorithmic processes that allow performer-initiation of a broad range of live sampling and direct accessing of sound and image synthesis parameters, moving between programmed patches and changing the qualities of digital manifestations from moment to moment.

For dancers working with wearable sensors, camera-motion-sensing and networked virtual environments, *real-time* is understood as a new medium of artistic creation in which the human body is a determining interface of communication while the *system* may also retain

its own autonomy and intelligence. Performers and machines interact in a continuous unfolding process which, technically speaking, is part of a much larger space of networked media transmission if the interactive apparatus is linked to other sites. The conventional organization and articulation of dance as choreographic practice relied on a coding that fixes the steps and sequences of movement (located in real space and, more often than not, within patterns/rhythms of music) and makes them repeatable. The machining architecture implied by networked virtual space and continuous computer processing guarantees that such fixity is unwarranted on the level of performance dynamics as well as on the level of machinic emergence, namely the potential of the system to evolve dynamically in ways that are not pre-programmed. I want to sketch some ideas here about such modes of organization, which are more intimately connected to navigations of particular supra-sensorial relations (within close proximity to technology and the architecture of interaction).

REAL-TIME

Experimentations in digital performance suggest new performer techniques that exploit intimate, proximal relationships to a hypersensitive immersive or augmented reality (environment) in which sensors, motion detection or camera vision systems and wireless transmissions operate as a 'measuring' of bodily activity. The technical-artistic design configuration offers



• Fig 2. Scene from *Suna no Onna*, Laban Centre Theatre, 8 December 2007. © DAP-Lab/Dans Sans Joux. Photo: Hans Staartjes.]

audiovisual, sensor and cybernetic frameworks for the computer calculations serving as dynamic, synaesthetic or kinaesthetic ‘transformers’ of performing interactions.

Regarding the cognitive-perceptual patterns of watching ‘dance’, it needs to be emphasized that digital performance with real-time media always involves projectional activities at the same time, i.e., simultaneous and deferred image, sound and light movements and ‘micro-tonalities’ which happen in continuous contingent (causal and non-causal) interrelationship with each other in the total architecture. The intertwining of sense perceptions in such a projective environment is intense, and a haptic visibility marks the enactment of movement that has less to do with steps, phrases or placements of the limbs than with gestural or postural articulations of motion ‘mapped’ onto image, sound and light movement. The articulation of sound (Julie Wilson-Bokowiec speaks of ‘kinaesonic’ gestures) and light (image) creates tactile feedback in the projected environment

outside of the performer’s body. There is a disjuncture insofar as the data acquired from the body drive other temporal objects in the environment.

Every user of such virtual, generative spaces participates in and creates their own dynamic ‘environment’ and its expressive qualities. The levels of control are variable; if the architecture involves intelligent agents or streaming media (transmitted from partner sites), the layering of indirect and remote manipulation of the kinaesthetic and the kinaesonic can be highly complex, especially if the kinaesthetic qualities of projected images contradict the human body motion observable in the phenomenal body. The articulation of digital objects by the body, yet at a distance from the body, induces new associations between sensations and sense perception. And these associations and proprioceptions cannot be assumed to belong to the ‘intuitive’ vocabulary of the dancer’s physical thinking and kinaesthetic intelligence.

In such environmental practice there can be no

set piece (choreographic), nor can one speak of improvisation, since the interactive potentials are shaped by particular aesthetic and mathematical principles requiring that performers adopt specific physical techniques to play the instruments of the medium and learn new proprioceptive and sensory processes.

For example, in the case of sensor-dance or sensorial/tangible interface designs, movement is not scored or cued but emerges as an enactment of real-time potentialities - a particular sensor worn on the wrist, arm or leg generates particular data - which produce digital content in the projected world. Such proximity to recognition systems analyzing enactive embodiment shifts the subjective experience of intentional 'choreography' toward a transactional category of collaborative design (software algorithms, live processing) which belongs - in a broad sense - to the discourse of artificial life and autonomous systems.

WEARABLE SPACE

Suna no Onna is a dance installation that exemplifies such transactions in its informational aesthetics, mixing autonomous behaviors in the programmed digital environment with real-time performance and live sound synthesis.¹ Two of the three dancers wear sensorial garments (designed by Michèle Danjoux), and the dancers' physical and gestural expression can subtly animate the projected landscape through the garments which, inversely, appear as a camouflage or as a kind of second nature, worn like the habitat that surrounds the inhabitants. The shifting relationship between forms and colors of the garments and the microtonal mutations in the landscape is partly effected by real-time generation of data on/beyond the body, while software patches and live coding also have a visual and sonic autonomy that does not privilege the dance but follows its own

¹ *Suna no Onna*, dance environment created by Dans Sans Joux, Laban Centre, 8 December 2007, directed by Johannes Birringer, performed by Katsura Isobe, Helenna Ren and Olu Taiwo, fashion design by Michèle Danjoux, music by Oded Ben-Tal, sensor programming by Paul Verity Smith, digital animations by Doros Polydorou and Maria Wiener, motion graphics by Jonathan Hamilton, scenography by Hsueh-Pei Wang.



• Fig 3. Scene from *Suna no Onna*, Laban Centre Theatre, 8 December 2007. © DAP-Lab/Dans Sans Joux. Photo: Hans Staartjes.



operational rules based on the narrative composition. The various garments prepared for the production are transposed from cloth to moving graphics and a fluid, sculptural, kinetic and cinematic form that resembles a visual kinetics closer to earlier experimental film (Moholy-Nagy, Léger) and Japanese animé than to dance-theatre. But the real-time performance is the sensorial hinge for an accumulative range of perceptions associating the wearing of textures and colors with the wearing of a digitally animated environment. The data for the animated landscapes themselves were motion-captured from our performers, but these data were transformed to a point where their source, their sensory-motor and emotional logic (motivation), was no longer recognizable. The

wearable interface makes the dancers become embedded in the world; they wear the space in the sense of affecting the flow and motion of the live filmscape and being affected by it in return.

Katsura Isobe's subtle gestures direct her first-person perspective into the animated world manipulated through her body and garment. This requires a deep practice and immense dexterity (rehearsing with the sensorial fabric), but we don't consider her behaviour as choreographic. Rather, her garment-character builds an affective and responsive proprioceptional processing through action that is connected not just to the image of 'character' created in the wearer or to the emotional relationship and expressional exchange between dancer and garment, but to the modulating control of the space. The

• Fig 4. Katsura performing with SensorDress in *Suna no Onna*, Laban Centre Theatre, 8 December 2007. © DAP-Lab/Dans Sans Joux. Photo: Hans Staartjes

calibration of the sensors, Bluetooth and MIDI transmission, and software programming and filtering of the data are complicated procedures that do not always create a comfortable fit with expressive gestures, and thus the modulation of the digital environment (generally referred to as mapping) requires continuous adaptation and modification. In rehearsals with our sensor programmer, mathematical considerations inflect kinaesthetics; no consistent repetition is possible as the sensors often behave unpredictably. Example: 'If data is patched correctly, and if radio (Z) with accelerometer (Y) in channels (X) and (W) is transmitting data we have to create a condition where the dancer knows that this movement (V) made during this scene (U) will have this effect (T) on this film animation (S) on this screen. This will be different for the next scene' (Paul Verity Smith). There are eighteen scenes in *Suna no Onna*, and to make control over the calibration scenes perfect, a number of other preconditions need to be met specific to a particular room on a particular day ... Patches and sub-patches containing a range of programmable functions thus always enter into the equation between performance and digital environment. This complex intertwining suggests a new emphasis on systems of exchange that cannot be reduced to movement concepts in dance. Although the concern with the mathematics of sensor articulation (MIDI values from 0 to 127 of course were a domain of music technology initially) may appear extraneous to dancing and acting techniques, it is second nature with electronic musicians and vocalists manipulating sound via a real-time interface. The interactive dancer's physicalization of images, sound and light, therefore, gives enactment within software environments a much more significant scenographic and conductive role - perhaps anticipated by Adolphe Appia's design visions for 'rhythmic spaces'.² The new dance techniques fuse live scenography and editing with real-time design in movement.

THINKING IMAGES

The particular contradictions involved in the 'controls' (programming/actuation) that guide the interface designs for human performers as well as for intelligent agents suggest that the generating of virtual objects or virtual movement need not be romanticized with melancholic notions of ephemerality and disappearance. Real-time design in dance need not be recorded to be reconstructible as it is already always an anticipatory, virtual practice of calculation. Dance and software (computational composition) form a couple in need of a different aesthetics of live coding that illuminate more effectively the mathematics involved in the creation of interactive dance.

Second-generation indirect interactivity (beyond the more direct 1:1 mapping of gesture to sound or image) heightens the sensorial experience of performance as the coupling of performer and virtual environment evolves in non-causal correlation with one another. Both performer and system respond to the other's enaction by undergoing self-permutations on the basis of distinct operational rules (a new form of 'post-choreography') that are internal to them. In moving towards indirect interfaces (optical and ultrasonic sensors or machine vision), however, creators of such performance systems generally prioritize the development of software techniques over physical techniques, and a performer's sensual and cognitive needs are not often addressed.

In his collaboration on Trisha Brown's stage work, *how long does the subject linger on the edge of the volume ...*, Marc Downie paradoxically speaks of 'choreographing' the 'agents' (animated graphics) derived from real-time motion-capture driven by an artist-designed AI software that responds to the kinematic data and generates particular behaviours. But he carefully distinguishes such motion behaviour from human, physical intelligence. The artificial intelligence software draws its own 'dance' diagrams live during the performance, and these graphic agents are projected onto a transparent

² For a bold reinterpretation of Appia's design visions (originally created for Dalcroze's eurhythmic dances), see Magruder 2007: 100-14). Japanese dancer Yukito Obara's avatar ('Gekitora') performed a 'wind dance' inside Magruder's digital 'Rhythmic Spaces' in Second Life during the CYNETart_07encounter festival (22:45 GMT, 17 November 2007). It was the world premiere of a dance that defies conventional description but forges unexpected links between Kleist's theory of the marionette and the kind of contemporary 3D environments for moving avatars explored, for example, in igloo's *Swan Quake* mod or their earlier *Summerbranch*.

screen in front of the stage, thus intermingling with the real dancers in 3D. The agents are software creatures, acting according to their artificial intelligence: they have their own autonomy. Their imagery comes about as they picture things to themselves, trying to make sense of what they see onstage in real-time as the dance unfolds. The intelligent-creature system is mathematics-based, and thus it is more correct to speak of a machine learning program, except that in this case the machine learns from dance, and this learning translates aesthetically, into a drawing process over real-time that constitutes a larger image composition, with past, present and future 'gestures', or gestural attempts. Downie (with his OpenEnded Group partners Paul Kaiser and Shelley Eshkar) is experimenting with 'thinking images' that can remember these attempts, and it is fascinating to speculate how a sensory-creature apparatus will grow up to project the illusion of moving geometries behaving as if they are choreographed 'bodies.' Or, rather, how the digital creatures will be perceived by human spectators as dancing scenographers.

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