GOLD
(Monstrous Topographies)

Exploring Bodies in Complex Spatiality: Trespassing, Invading, Forging Body(ies)

Dagmar Reinhardt + Lian Loke

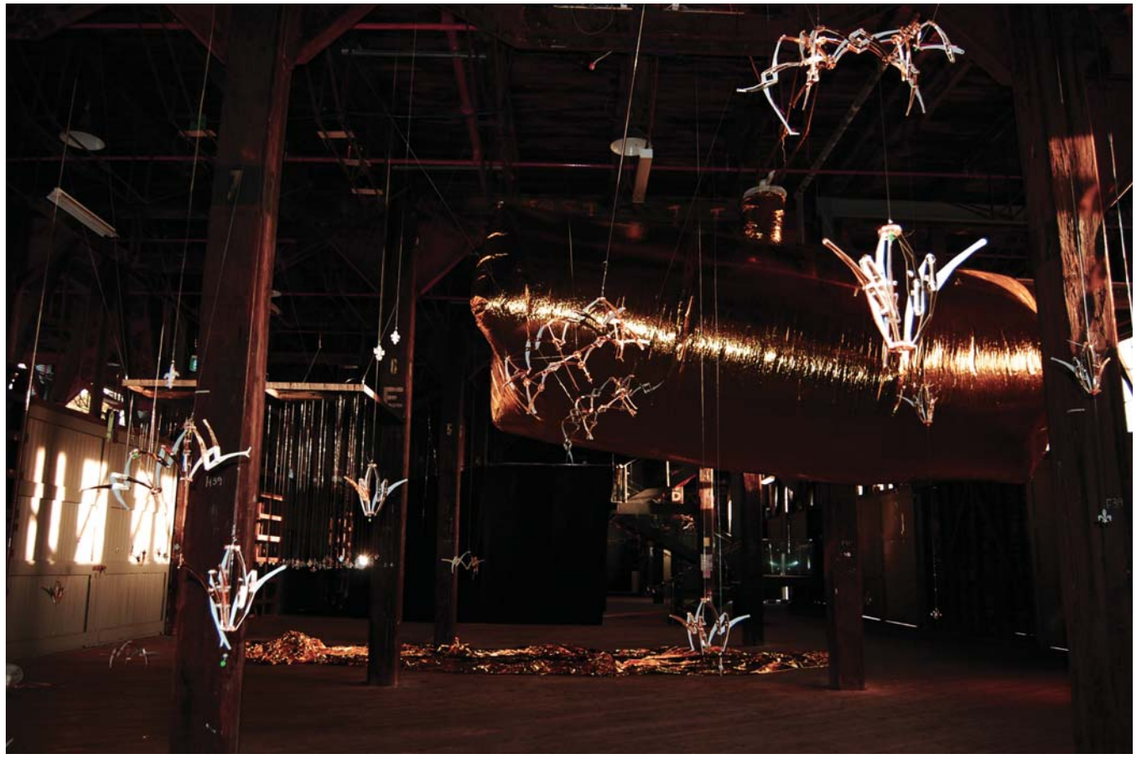

Figure 1: GOLD, installation, 'IloveToddSampson' (Pier 2/3, Walsh Bay 2013).

Abstract

A complex corporeality, as this paper argues, can be established by revising our understanding of the relationships between our body, and bodies associated, inter-actant, investigative or correspondent to our body. Fastforwarded by advanced computational design and fabrication, and increasingly embedding sensory and interactive technologies, this poses a challenge to the conceptualisation of body, material and space. At the intersection of architecture, human-computer interaction and choreography, we ask: What is the current status, and potential, of body and bodily experience in this relation? We are exploring here Duchamp's Large Glass, and Grosz's Theory of Spatial Complexity as conceptual drivers for a sentient environment that offers relational exchange for a choreographed number of bodies. GOLD (Monstrous Topographies) is a spatial interactive installation set in the context of a performance that combines actors, audiences, kinetic interactive elements and programmed segments into a complex topography of inter-actant bodies. The research is driven by a notion of material latency that informs the recontextualisation of material, body movement and space in a choreographed approach. Through this, the conceptualisation, performance and choreography act as tools for, and modes of, a critical engagement with corporeal identities in a complex spatial design, enabling a nuanced understanding of human interaction and experience within space.

Introduction: Corporeality, Spatiality, Spatial Complexity

There exist a multitude of different understandings and concepts of the body; from a literal body with specific physical measurements and physical capabilities; to a body with specific individual characteristics - of race, gender, age; towards a phenomenal body - one that senses and experiences. As an example, phenomenology refers to the body as a structure of perceptual and behavioural competence.[1] Yet, as one might argue, bodies are by no means fixed and separate entities, but constantly changing; through an infinite and complex system of processes occurring in and outside of bodies; and their relationships with an Other (a body, context, environment, space, or trajectory). Phenomenal understandings range from subordination of bodies to functionality and inhabitation of the real world, towards enclosure of imaginary spaces, visions, dreams and alternate realities.[2] Furthermore, Deleuze discusses sensation as that which enables a departure from the body beyond sensory capacities.[3] Finally, a choreographed body may dissolve in the act of actual movement[4], which may act as temporary spatial pivot through which space can be internalised. Spatiality, and spatial complexity, are in an intricate, reciprocal relationship that inform (and are informed) by understanding and conceptualising the body.

Current design realms address these issues by producing novel environments through computational design and digital fabrication. Composites of physical form, new materials and

computation consequently expose bodies to new paradigms, such as kinetic, autonomous and interactive behaviours that can be embedded in material objects; thus blending literal bodies with virtual or digital counterparts to form new hybrid, composite or prosthetic arrangements. The materiality of space, and its seamless virtual and the physical characteristics, informs a culture that continuously shifts between parameters and criteria that interplay constantly – space and time, material and body, movement and space. Consequently, the question arises as how to conceive of spatiality, environments, topographies, thresholds or boundary conditions in which or against which a number

of bodies (inter)act. This poses new challenges and issues for cross-disciplinary design concerned with the human experience of the designed environment. Specifically in an architectural and interactive context, the materiality and timing of these environments then becomes relevant for the choreographing of bodies. Beyond environments of 'static' materiality, spatial complexity may be based on a materiality of latency, as Grosz suggests.[5] This enables a rethinking of concepts of body, time, space, data, organisation, structure, matter, individual, and movement that reach beyond a 'timed' architectural environment. Hence, to situate Grosz's theory of spatial complexity in a context with bodily engagement, we open a strategic discourse for ideas, concepts and design methodologies of a materiality of latency in and for the embodiment of architecture by reviewing a choreographic approach that bridges bodies in a performance environment.

Since the 1980's, architects and artists have been creating responsive environments and installations for aesthetic purposes, through installations that have been designed as predominantly screen-based or sonic immersive environments, using various sensors to detect and respond to the presence and activity of visitors or performers.[6] A recent shift to digital fabrication and material environments replaces two-dimensional visuals/screens with three-dimensional forms that exhibit dynamic behaviours in physical (c.f. virtual) space and time (e.g., Philip Beesley's Hylozoic Ground, 2010 [7]; Reinhardt and Jakovich, Trivet Fields, 2009 [8]). Much of the research in ubiquitous computing and responsive architecture is now driven by innovation in material properties; the fusing of the digital and the physical in 'transitive materials' [9]; and the application of generative or genetic algorithms[10] for programming dynamic responsive behaviours. Yet beyond isolated aspects of materiality and coding/programming, the challenge remains as how to conceptualise a choreographed spatiality that relates to corporeal complexities – a diverse and correspondent set of multiple component parts, multiple bodies, interactive elements, overlapping trajectories, or gestural impact. This is important because, as Tabor notes, a basic spatiality derives from exchanges between the self, the body, and the contact with other bodies (and selves).[11] The exchange with the Other generates (body) identity. Corporeal complexities may be argued to arise when the process(es) of understanding, perceiving and enacting the self, body, identity and spatiality become negotiable through an open choreography.

GOLD (Monstrous Topographies)

As part of a research into multi-sensate environments situated at the intersection of architecture, human-computer interaction and choreography, we introduce here a spatial interactive installation. GOLD (Monstrous Topographies) was produced for and presented to the public in the play 'I Love Todd Sampson' at Pier 2/3, Walsh Bay, February 2013, Sydney (figure 1).[12] The play's narrative is based on the unimaginable act of human beings betraying, exploiting, humiliating, destroying one another for money. When the key figure, Laura, was subjected to monstrous desires by her father selling her to his mates at the local RSL club from a young age, her vehicle of escape became the act of dissociation – the first caused by a man of music, a cellist who played Elgar's Cello Concerto. The project GOLD (Monstrous Topographies) illustrates 'The Spence Room'; a space that evokes a spatial echo of Laura's dissociative state of mind; designed as a plush, rich environment that holds actors, musician and spectators in the embrace of a 8:45min sequence. GOLD (Monstrous Topographies) develops a series of conceptual approaches that depart from the monetary value of the metal, to review consequences, behaviour and beliefs in economy, history, religion, folklore and contemporary context to indicate a potential passage of survival for the main figure. The work is a collaboration between computational design, interaction design, digital fabrication, sound and body performance; an interactive, responsive installation; that relates audience and actor movement to a sensate topography of inflatable objects and discreet structural elements; that delineates zones of performance and seating area; and that partially responds to the musical landscape unfolded by pianist Alister Spence.

GOLD (Monstrous Topographies) examines the relationship between different bodies, topographies and behaviours in a choreographed spatial environment. The work approaches the conceptualisation and choreographing of these bodies in both digital and physical realms and on different levels; through advanced geometries, fabrication, programming and interaction. Developed from a perspective of cultural and intersocial concerns, aspects of desire, memory, hunt, loss, curiosity, imagination, identity and recognition become drivers for prototypes and emotional qualities. A key aim in this research is to explore how a number of different (fabricated and animated, human and machine) bodies can be made to interact with each other so as to form new body constellations and identities: complex corporealities. The research is based on computation in design systems that parallel the choreographed behaviour, link it to a simulation of material response, and incorporate it as an integral part of the process. As a generator, as an observer, and as an active performer, the installation relates to a digitally fabricated, programmed, complex spatial interactive environment in which different bodies meet with each other.

Duchamp's 'Large Glass' -- Tracing Spatiality, Identifying Corporeality

GOLD (Monstrous Topographies) deploys Marcel Duchamp's 'Large Glass', also titled 'Bride Stripped Bare By Her Bachelors, Even', 1925, as a conceptual base, diagram and framework for the three-dimensional translation into a choreographed space of the performance (figure 2). Beyond being the domineering artwork that forever changed approaches to painting[13], this work can be seen as setting a context of a four-dimensional spatiality, in which sets of bodies are linked through diagrammatic layers in multiple exposures of identities and personalities.[14]

The 'Large Glass' combines two distinct habitual domains within the two parts of the glass surface; the domain of the bride, and the domain of her bachelors, which blend in with the surrounding environment, as the glass stands free in space. Duchamp refers to the spatial interdependencies of the work as "a 4-dimensional finite continuum [that] is generated by a finite 3-dimensional continuum rotating (and here the word loses its physical meaning) about a 2-dimensional hinge".[15] Conceptually, both the frame and the dividing line between the planes can be understood as a hinge around which a first, theoretical rotation takes place, resulting in a cube (a generic description of space). A second rotation occurs when a potential spectator moves around the work (thus 'rotating' it), thereby changing position and viewing it from different angles. This behavioural, performative interaction is a four-dimensional operation through which both the observer and the observed are re-constructed, hinged in space (figure 3).

Duchamp's 'Glass' represents the diagram of resetting corporeal identities; it depicts multiple bodies, possible interactions, narrative sequences. It might be argued that the work acts as an 'interface'; as the set-up can only be activated in the mind of the beholder who imagines the process taking place, fleshing out bodily actions through imagination. Its potency derives from a moment that never arrives for a female subject that is locked in a state of delay between stages of body identity of virginity, and of bridehood.

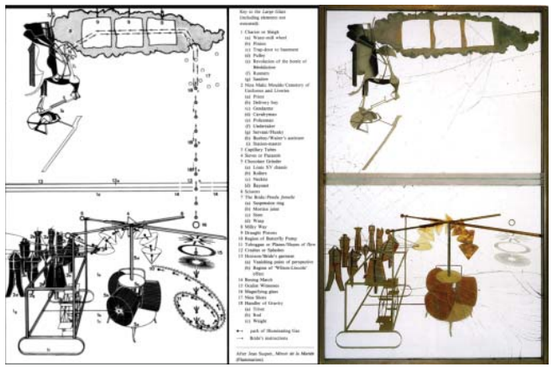

Figure 2: Duchamp, Large Glass, Diagram and Painting

In the upper part of the glass, the 'Bride's Domain', the most dominant figure is a suspended female body represented by a cloud shape. She is supplemented by the prosthetic structures of the 'Wasp/ Sex Cylinder' from which a needle almost touches the border of the frame. This line ('Juggler of Gravity') is crucial as it prompts separation as much as of possible interaction. It 'hinges' an external rotation, and constitutes the relationship

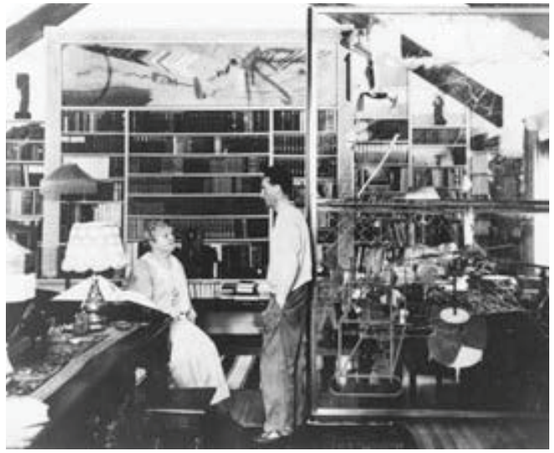

Figure 3: Dreier, Duchamp, Large Glass

between Bride and Bachelors, between the spectator's actual body, and a perceived virtual emotion or sensation, framing desire.[16] It is not clear if the suggested transformations ever occur, or if the bachelors remain an imagination of the bride, as she herself is an imagination of the bachelors or the spectator, belonging to a parallel reality. The 'Bachelor Apparatus' is placed on the lower half. It contains a synthesis of quotations from industrial production, dress codes, mechanical processes and pleasure supplies. Duchamp proposes a system of fluid energy that fluctuates between both domains and which never coalesces into stable forms, but interpolates between the different bodily entities. As part of the machinic process, the 'Malic Moulds' (uniforms from mail order catalogues, depicting specific male dominated professions) are filled with illuminating gas (a mode of male sexual energy). The gas expands when perceiving the litanies of the 'Chariot/ or Bachelor Glider', forcing the moulds to abandon their individual shapes. They move through the rods to the parasols (sieves), are converted into liquid form and fall down in a (orgasmic) splash.

Desire is the main driving force in the Large Glass, yet this desire is intricately linked to participation of the observer; it is enacted, embodied, and actualised. A transient state of being is introduced through this work that expands and animates the corporealities of bride, bachelors and spectator who actively experiences and embodies the depicted process. The interdependency between the gaze, the display screen and the object, person and perceived space manifests a cycle of interaction whereby perception is not passive, but affects the viewer as what is seen is interpreted. This performance of bodies is non-linear and non-directed, and prompted by a network of surveillance, desire, display and control that involves all relative parts, their roles and identities. The 'Large Glass' describes these imaginative, suggested, potential, perhaps factual data, relationships and interactions. It acts as an interface of bodies and their relationship in a complex process of corporeal exchanges of identities, where each relation is based on an intention and requires constant negotiation.

From Duchampian Body Diagrams to Hybrid Bodies in GOLD

The installation discussed in the following overcomes the default line set in Duchamp's framework. By associating the two-dimensional, diagrammatic relationships of bodies, signage and machinery between Bride and Bachelors, a a four-dimensional

Figure 4: GOLD components in the industrial setting (perspective overview).

constitution of choreographed and spatialised elements and bodies is derived for GOLD (Monstrous Geographies). Similiar to Duchamp's strategy whereby a body never exists as singularity and in isolation, but in interaction with other bodies, choreographed objects, or strategized habitual landscapes, again here the body acts/performs/is actualized as a hybrid (with a strong link to concepts of monsters, chimeras). Our understanding of 'monstrous topographies' refers here to the multiple levels embedded in the term. The monstrous is understood a result of unnatural combinations on a literal organizational level; but also a phenomenal or sensational description; as a monstrous desire or thought; as behavioural response or teased engagement. This strategic approach opens modes of operation in the installation; by interfacing different body actualisations; by staging a becoming other.[17]

In GOLD (Monstrous Geographies), the corporeality and spatiality of bodies shift between conceptual and actual levels that are shared between narrative, diagrammatic and spatial frameworks, and boundary conditions. These bodies are derived as expressions of relationships in the 'Large Glass', and can be roughly categorized as three distinct body groups; the 'Bride'; the prosthetic mechanisms; and the swarm components that interact with the bodies of actors and audience. The 'Bride' is expressed as three golden clouds (inflatables produced from emergency blankets), which signify Laura's state of virginity and forced bridehood. These clouds are highly responsive to contextual wind forces (streaming with wind channelled though façade openings), and situated in spatial relationship with a swarm of component elements (Fleur De Lis). They delineate the area of performance, and act as backdrop and entrance point for the stage setting. The second body group contains different species of prosthetic scissor mechanisms (based on a Chuck Hoberman Sphere) that are assembled as different entities (the 'Crowns' and 'Spiders'), and which signify disabling, enhancing, or replacing aspects of relationships. The third body group of swarms is derived from a series of morphological variations of a single base type of a Fleur de Lis (and 64 individual interpretations repeated to embody 684 non-consensual encounters). The Fleurs are set as swarms with distinct behavioural capacity, alternating from static to kinetically responsive formations that accompany the musical landscape (and which are expressions of fluid energy exchanged between the piano/ chocolate grinder and the 'Malic Moulds'/perpetrators/ audience).

Through insertion of these animated, responsive and spatialised bodies, a complex system of hybrids arises in which bodies are crossing over, are programmed or linked together, creating a balance, eruption and sensation that renders bodies of the individual participants (and that includes the installations's bodies as much as the audience's and actor's) as 'prosthetisised', contextualised, extended, affected). In this manner, the ownership, faculty, permanence and identity of the individual body is challenged in multiple acts of sharing, dissolving, trespassing, reconstructing engagements, sensations and experience.

The relationships, interactions and exchanges between the collective of a number of bodies (from situated installation components to kinetic elements to actors and audience) are organised by choreographing movement lines and paths, against the backdrop of an industrial setting in which the play is situated (figures 4+5). Whereas traditionally choreography is the art of creating a dance with the moving body in space and time, we extend here choreographic principles to recontextualise body, material entities and movement in and through space. This choreographic approach proceeds through learning across different bodies, in exchanges between human movement and animate entities (e.g., the machinic entities of Fleur De Lis and Spiders), and thus questions the stability of relationships. The installation explores the potential for material strategies, conceptualisation of multiple layers of interpretation, open performance through an approach to choreography that act as modes of critical engagement with corporeal identities. That is, instead of a moving body within a stable, determined spatial setting, the body engages with the actuation of multiple kinetic structures, topographies and elements that work intelligently with changing physical paths and gestures.

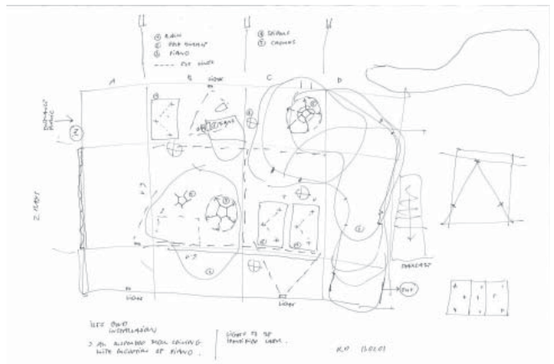

Figure 5: Mapping Interaction between different bodies (note: to be CAD redrafted, with overlay traces of action/interaction on it, and multiple versions highlighting different information – eg. Audience/performer trace, sites/points of human-machine interactivity, the different kinds of bodies – human, machine, hybrid). Fig 5: Mapping Interaction between different bodies, diagram showing the timeline of the scene – key events as time passes in ten minutes (note to be produced).

Figure 6: GOLD and a situated spatiality: spider (kinetic-responsive), crown, detail of scissor mechanism.

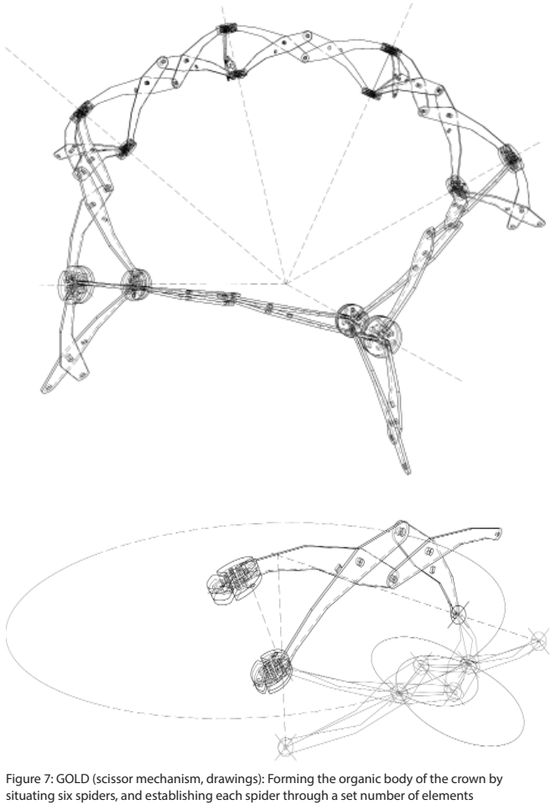

Figure 7: GOLD (scissor mechanism, drawings): Forming the organic body of the crown by situating six spiders, and establishing each spider through a set number of elements

The performative capacities of human and animate bodies in GOLD are played out through a number of different choreographic sets of movement that can act as a framework with which to organise the relationships between bodies, and generate temporal assemblies of meaning and interpretation. Beyond the self-organising multiple audience body that refreshes with each performance, both the prosthetic body group and the swarm bodies are prompted to organise in behavioural movement. The swarm of Fleur De Lis (lasercut modules of mirrored Perspex) are coupled with a servo motor actuation to correspond with the musical score, following an autonomous, pre-coded moving sequence. In contrast, the animated singular entities of Spiders (assembled scissor elements) respond individually by retracting from movement areas. Both body groups were scripted and digitally fabricated as composites of physical form, materials and computation. They manifest bodies that cross boundaries between analogue and virtual realms through their design process and spatial placement. Developed in the computational realm of 3D modelling software, they reconnect to that virtual topography though a code that allows these animate bodies to contribute kinetic, autonomous and responsive behaviour. This choreography thus sets the temporal presence of performers and audience into relation with the designed, manufactured and programmed body entities so as to stimulate, invigorate and translate an electronic dataflow into a sensate response and change behaviour - for the bodies we habituate.

A materiality of latency -- Shaping Complex Bodies that can reconstitute relationships

GOLD (Monstrous Geographies) produces complex and intense bodies by strategically rebalancing their relationships towards each other. As part of our choreographic approach of strategizing bodies, we employ a design methodology that supports a complexity through unfinishedness, ambiguity or latency. In an architectural context, this includes the architectural body that is informed by material latency, inexactitude and intensity. This latency resonates with a temporalisation and an intensification of architecture through the way these bodies are materializing time. GOLD applies Grosz's Theory of Spatial Latency and durational characters of space ('loci of intensity, compression and elasticity') in a context of interactive spatial installation. Grosz suggests that relationships between time and space are characterised by zones or 'loci' that amplify spatial materiality: "If duration exists in states of contraction and expansion, in degrees of uneven intensity, … then perhaps space too need not be construed as even, homogeneous, continuous, infinitely the same. Perhaps space also has loci of intensity, of compression or elasticity, perhaps it need no longer be considered a medium…The very configuration of space may be heterogeneous, just as movements and configurations of duration vary. Perhaps, in other words, there is a materiality to space itself, rather than a materiality residing only with its contents".[18] Different formations of matter in space privilege different organisations of time, thus enabling different spaces of interaction that are operated by the individual appropriation. This appropriation is true for a number of scenarios: adapting to a given spatial context, adapting to other bodies of the same nature, and responding to external stimulation (e.g., kinetic apparatus). GOLD applies this approach to latency and durational characters of space in the installation as multiple process that inform bodies; in the flow between contextual layers; in the transfer between structure and body; in processes of movement and performance; and in the interaction with actor and audience. In doing so, the work counteracts 'ethic of statics' of spatiality,[19] and instead privileges an interpolation between matter and time in order to engage in the reconstitution of bodies, and bodily identities.

The base mechanism of formulating a body, and relationships between different bodies of the same kind or other species, can be enabled through rethinking latency in material, and allows for different descriptions of material formations or behaviour; different techniques for structural or organisational specifications; and can act as initiative for experiential effects and sensations. Gold explores a material latency for composite, choreographable bodies specifically through the way in which these bodies can be constituted in morphological variations. As an example, all mechanistic and prosthetic bodies are both based on a generic scissor mechanism, whereby six major components constitute a body ; the Spider, whose major characteristic is an ability to unfold (in different positions due to its mechanical nature) (figure 6). This morphology is then extended to formulate a more complex body/ies; the Crown (figure 7). Inbuilt in the Spider's mechanical composite body is a potential to adapt to spatial context due to its mathematical coding. More complex formations combine the former Spider's three major 'limbs' in a hexagonal pattern (potentially forming the Reef, not executed here), following nature's base code for self-forming systems (which is a generic growth code also for animal bodies as diverse Lizard skin patterns, compound eyes in bees, or plants). These spiders receive their spatiality, their bodily identity, through different stages of expansion and contraction, through a coded elastic response to formative (choreographed) requests of their bodies in space.

The crowns and spiders with their kinetically designed expansion/ contraction and programmed behaviour refer to a literal (physical) expandability, yet notions of elasticity may also be deployed as choreographed changes of matter in time, through morphological shifts. Similar to their biological precedents, these animalistic entities are the results of forces and resistances other than generic types; they define the duration of a form through alternatives. [20] Gradient conditions of the performative context shape the individual form of which each is a result of duration, that is, a process version informed by specific tuning of choreographic criteria. Differences can thus be traced through the deformation through body parts, which correspond to individual (actor, audience) bodies. These deviations seem to simulate a 'species' adaptation to changing contexts; a change of material form effected by the movement of matter.

In GOLD (Monstrous Topographies), a phenomenal elasticity may be considered to facilitate a shift in coding and alterations; of the individual identity and subjectivity; of the body; or of the act of spatialization. When character properties and programmatic protocols are shifted, then body or space may be reconfigured, recombined, and reinterpreted. Individual perception relates to the self, to what is consciously perceived by experience. This opens a discourse that allows departures from predetermined expectancies and contingencies, because a complex corporeality interpolates between the interiority and exteriority of the self, between form and content, between the appearance and identity of bodies and objects, species and spaces.

Conclusion

This paper has introduced a research that explores complex corporeality by embedding material latency to inform relationships between different bodies in the context of a choreographed performance. This has been implemented through a new design approach of material latency that bridges between human and artificial animate entities, and their behavioural potential. In reviewing GOLD (Monstrous Topographies) as an interactive installation in the performance setting of a theatre play, we have discussed a new potential of body and bodily experience that derives from constitutions of relationships between our body, and bodies associated, inter-actant, investigative or correspondent to it. In a current context of computational design processes, this impacts on the conceptualisation of new physical forms and computation embedded in material objects so that bodies are being reconstituted as the environments we inhabit and the objects we interact with begin to exhibit new properties and behaviours of an animated, kinetic nature. Interfacing body, materials and prosthetic mechanisms as integrative parts of a choreography enables us to figure and configure these together. Performance and choreography between complex body arrangements as has been discussed can be used as a mode of critical engagement that enables a nuanced understanding of human interaction and experience within ephemeral, performative, latent, and interactive spaces.

GOLD (Monstrous Topographies) demonstrates our emerging approach to the conceptualisation and choreographing of complex corporealities, which brings together the disciplines of architecture, human-computer interaction and choreography in a creative friction. Traditional disciplinary notions of body, matter, computation, interaction, spatiality are pulled apart and refashioned, in a contingent negotiation. The processes by which the design of choreographed environments takes place are similarly negotiated. Placing our work in a theatre context provides a semi-closed system of choreographed manipulation, where audience in effect becomes the wildcard. Their passage and interaction through the theatrical space and time can only be controlled to a certain extent; they are at liberty to deviate from the script and planned trajectories of the performance. This introduces another dimension of complexity, and further complicates the complex corporealities engendered by the network.

Acknowledgements

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