Exhalent Gestures: Inter-subjective Agency and Digital Materiality
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As a sculptor engaged with digital-technologies I have found my practice confronting a very fundamental sculptural question –

What is materiality? –

Or more specifically how should we conceive of materiality in a hybrid digital/physical practice?

This attempt to understand the constructs of digital materiality has arisen from within a practice that seeks to engage digital-media on the same footing as corporeal media.

From this position the material sensibilities and tacit knowledge that inform many sculptural practices were taken – (rather naively perhaps) – as givens in regards to digital-media.

In demanding to understand the inherent properties of digital-media, a new-media artist might well have turned to the wealth of digital-media theory in this field. – However approaching the question from a sculptural perspective my stance has been to reject the representational function of digital-media as providing unmediated access to digital materiality and strive to understand the ontological nature of *"the digital"* and a means of engage within sculptural practice.

In order to do this it is first necessary to layout a very condensed and, – I'm afraid, – rather dense theoretical framework for consideration of digital materiality before looking at how aspects of this can be seen in two recent works – ØForm and TradeAir.

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So what's the problem with digital-media?

Digital-media inherently adopts representational and mimetic strategies that are reliant on analogue media.

The dominance of the screen as a digital interface and its function as a window that is "elsewhere", reaffirm Manovich's proposition that digital media operate from an imposed modality that is in deference to analogue materiality.

NEXT (manovich quote)

However developing Laura Marks' notion of haptic visuality in regards to the cinematic screen, – it is possible to consider a materiality of digital media as inherently an embodied experience without recourse to representational strategies.

NEXT (Laura Marks video) PLAY

In the same way that cinema and video can engage with haptic materiality, – *"the digital"* might also be considered as having a non-mimetic materiality by defining materiality in terms of the subjective body.

While Marks affirms the role for embodied experience in materiality there is still no phenomenological access to *"the digital"* through digital media. Given that the body is assumed to be analogue this effectively negates digital materiality beyond representation.

The term *digital* is loosely used as a qualifier of an object – for example digital-network, digital-camera… – However digital-media is distinct from *"the digital"* in the sense that it is an artefact of that which is digital.

"The digital" is really the underlying *structural method* that results in the production of what we call digital-media.

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NEXT   *So what is this digital thing?*

David Lewis provides the most widely accepted definition of *"the digital"* as being a discrete representation in opposition to the analogue that he describes as a continuous representation. However, defining both digital and analogue as forms of representation is, for reasons already discussed, problematic to the consideration of digital materiality.

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In addition to making useful distinctions between the Deluzian virtual and *"the digital"* Aden Evens argues that the inherently hermetic digital opens to the actual through what Evens calls "the fold" – *"the mechanism by which the digital connects to the human and the actual"*.

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However Evens focus on *the digital* as a technological function, – is a narrow interpretation of Lewis's broad definition in which the digital is a state of being not restricted to computer operations.

"The fold", – I suggest is really an inter-subjective overlap that allows not simply humans and computers to *"touch"* but for the digital to be actualised and accessed as a material.

What then is *"the digital"* as a material – independent of representation and unbound by technology – and how does it possess materiality as a non-corporeal agent?

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Materiality

Addressing the philosophical problem of materiality, Daniel Miller rejects the dualism that distinguishes analogue and digital, in favour of a phenomenological approach in which materiality has a shared agency between embodied experience and material object.

The implication here is that materiality can, – or perhaps should be, – approached from a phenomenological position in which as Merleau-Ponty says – *"the seer and the visible reciprocate one another and we no longer know which sees and which is seen"*.

In such a shared agency, embodied perception and material agency break down the subject/object dualism to co-constitute materiality.

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Materiality is then dependent on perception – or as David Kirchhof argues –

materiality exists only in the "*'symbiotic interplay' between human embodiment and material properties…"* – Consequently non-corporeal agents, such as the digital, <u>can</u> possess materiality as readily as corporeal agents.

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Digital materiality is then as much a property of the body as it is the digital subject. – That *the digital* achieves materiality though embodied experience now makes sense of Mark's phenomenological analysis of film in which – materiality lies in a perception of the body.

NEXT Shared Agency

Kirchhof's argument for shared agency is of course reliant on Latour's Actor Network Theory.

However unlike Kirchhoff who privileges embodied experience, actors in Latour's network are equal with no privileged position given to human perception.

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As Latour's actants are irreducible there can be no external actant. – Thus *"the digital"* becomes separated from the mimetic manifestation of digital-media. – We should not see a digital image as a linguistic expression, – as Manovich proposed, – but rather it must stand alone as an agent leaving *"the digital"* to stand for itself. – If irreduction thus appears to render the digital in invisible this is in fact the very point at which its materiality might be revealed.

NEXT *So how can we access the digital?*

Reinterpreting Lewis definition of digital and analogue states in a Latourian context, Luciano Florridi proposes an approach to their dichotomy by reframing them as levels of abstraction.

For those of you familiar with MAXMSP this is neatly demonstrated with pairs of floating point and integer objects.

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Florridi's detail argument <u>against</u> a digital ontology that defines reality as fundamentally digital in favour of an informational approach in which the world is understood by its structures, – is well beyond the scope of this paper. – However accepting Florridi's case for Informational Structural Realism the digital can be approached as a structural method, that allows for <u>relata to be seen as structural objects in themselves</u> and provides a schema in which the digital can be identified.

While we now have the means of locating the digital epistemologically this is of limited use to a practice-based discipline.

We are however left with a theoretic proposition that: – Digital media are representations that point to *"the digital"* which, – as a non-corporal actant, – has materiality through a shared agency with a human agent – whom we assume to be analogue.

While Informational Structural Realism proposes a feasible schema for epistemological understanding of such materiality it does not provide a practical means of engaging with the digital.

Having briefly identified ontological and phenomenological frameworks for consideration of the digital materiality – I return now to digital-media as a means of proposing a hypothesis for achieving practical access to digital materiality.

in film and, – like Deleuze, – allows us to break down the image into types of movement-images, there is still no means for reconciling a shared agency between the analogue and digital without recourse to some form of representation or concealment within some LoA-based grey box.

NEXT Gesture

Giorgio Agamben provides a solution to this by breaking down the fixity of the movement-image and proposing *gesture* as a particular event that is – "*neither production nor enactment, but undertaking and supporting.*"

Gesture for Agamben is a structural object, – a network of relationships in a shared agency between subjects, that offers a resolution to the lack of phenomenological access in Florridi's structural schema.

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Support for the role of gesture in mediating between subjects is developed further in Young's investigation of gestural inter-subjectivity. Young locates Merleau-Ponty's *"intentional arc"* as a category of gesture that:
        loops through the body;
        loops though the body and the world and
        loops through the body and the virtual world.

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Inter-subjective gestures – *"suspended between manipulations of objects and manipulations of one's own body"* – inhabit all actants in a network simultaneously.

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Rather than being emblematic or representational constructs, they are a means of mediating between digital and analogue.

It is the ability of the gesture to <u>overreach</u> the body while remaining embodied, – to transcend subjectivity by entering into a schema comprised of human and non-human agents, – that has emerged in my practice-based research – where – inter-subjective gesture is seen as a potential means of translating within a network of relata between embodied experience and material agency in order to actualise digital materiality.

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NEXT ØForm

Turning now to examples of my practice – I want to focus two different gestural methods of approaching the digital. – While neither is seen as realising a materiality of *"the digital"* as it has been laid out, – they do serve to test the hypothesis that inter-subjective gesture is a viable strategy for engaging digital materiality.

In ØForm hand movements, – that we might see as mimetic in that they appear to describe a shape, effectively model a digital form. – In this sense the body appears tied to the representational constraints of digital media. – However a significant shift occurs in the body through the processes of the work.

ØForm – undertaken as part of a trans-disciplinary research team – was aimed at developing an action-driven 3D printing system. The project uses Xbox Kinect and blob detection software to track the movement of hands that enter into a capture space – a narrow plane of space in front of the users body. – By evaluating the volume of each hand within the capture space the software computes dimensions on three axes.

As a simple example – the position on the y axis is derived from the volume of the left hand presented to the camera. – With only the tip of a finger in the capture space the Y axis is set to 1

The relationship between the movement of hands and the resulting from is deliberately estranged from the shape being generated in real-time on a screen. – No longer do hands compress a shape by coming together as they might in throwing a pot. – Rather the hands engagement with

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form is via a series of algorithms that render normal spatial relationships obsolete.

In both these cases the body and material work together but with one significant difference. – In ØForm <u>the body is forced to learn action that rebut bodily spatial norms.</u> – With spatiality defined by the software, the body's normal spatial orientation is over-ridden. – The body is left behind as the user defers their movement to the screen, entering into an "intentional arc" that binds the body to the software.

The experience is one that diminishes the dualistic opposition of body and screen by drawing them together in a schema of the exchange reminiscent of Sherry Turkle's decentred-self, in which the body performs many roles at the same time. (Turkle, 1994.) It is as if the software is pushing back against the body – making it contort itself to the software as it controls the software.

But exactly what is the user of ØForm sharing agency with? – What is its material nature?

I am not claiming that this algorithmic interrupt means the body is engaging digital materiality. – The materiality that is realised in the network between body and the digital agent is still encapsulated in the mediated space of the digital media screen. The representation on the screen still dominates the gesture, blocking us from the digital. – However there is one further function within ØForm that brings us closer to *the digital*.

ØForm is built buy lofting between a series of profiles along a user-generated path. – Rather than profiles being updated in a continuous analogue stream, the software deliberately uses a low sample rate. This sample rate generates a latency that is not inherent in the digital-media artefact or the body but a product of their co-constituted digital schema.

Latency is the interruption of contextual time caused by the structural method of the system. Neither analogue nor digital modes exhibit latency in themselves. – Latency occurs in the inter-subjective gestural schema between the analogue and the digital. Like Aden Evens "fold", latency is a "mechanism by which the digital connects to the human" by interrupting the continuity of the analogue body.

> *"Anywhere the digital meets the human, anywhere these world touch, there must be a fold."* (Evens, 2010)

TradeAir

The nature of the gesture in ØForm is external – the body literally reaches out to engage the digital. – The inter-subjective action occurs outside the body, leaving it functionally intact.

In another body of recent work exhalent devices operating as actuants, identify an alternative approach through which the body may be seen as engaging *the digital*.

In TradeAir localised and cellular network information generated by participants breathing into exhalent devices, is used to open valves that inflate small rubber bladders. – 3D printed receptors vessels house small fans that generate a current when activated. – This current is evaluated by a microprocessor to determine the volume of air passing through the system. – In the case of TradeAir these inflate bladders with compressed air.

The exhalation serves as gestural input, — as a structural method in a network, interfacing with the digital-media.

The relevance of this work to this paper is the function of breath in regards to the modality of the body. – Again I am not citing these works as having engaged *the digital* but using them to identify strategies through which such a proposition can be entertained. – Exhalation here is simply a means of activating representation though a digitally mediated system.

This system, – like the others in the series, – involves microprocessors and transcoders that convert analogue signals from the body into digital format. – The action is inherently one of representation in which electronics serve a mediating role.

My interest in these works is not in this functionality but how, – in breathing, – the body operates in an apparently contradictory multimodal manner as it internalises that which is external.

Under normal circumstances breathing appears as a continuous analogue flow in and out of our bodies. Yet in defining it in terms of dualities such as "in" and "out" it assumes a discrete function.

I can trace my breath as it passes through my mouth in a continuous – analogue mode, yet at some unspecifiable point the air ceases to be an alien element and becomes part of the bodily self while remaining

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separate from it. – The bodies modality is simultaneously continuous and discrete, analogue and digital.

Rather than being some hyperventilated state, I see this as entry into an inter-subjective duality in which the body reaches beyond itself – within itself.

Facilitated by the structural method of the work that focuses attention on breath as a gesture, – the binary opposition between body and world – between participant and artwork – breaks down, until the body is seen as functioning in a bimodal – digital/ analogue manner. – Though interaction with the artwork the body extends itself into the work at the same time as the work embraces the participant.

As Sundar Sarukkai summarizes in her interpretation of Merleau-Ponty's inside/outside dichotomy – *"the body breathes the world and the world breathes the body.*

Unlike mimetic gestures such as movements of the hand described earlier, – *self-touching* gestures such as breathing are suspended between digital and analogue modalities as the body overreaches itself inwardly, providing a means by which the modality of the body might be reconstituted.

Conclusion

What I have tried to quickly sketch out in this paper is part of a much larger thesis concerned with relocating the digital within sculptural material practices from which it has been estranged by digital-media technologies.

What I have identified in these two works - ØForm and TradeAir, are potential methods by which this might be reconciled.

These methods look to the *interrupts* that cause a suspension of continuity of, and within the body, that is afforded by engagement in an inter-subjective network that provides un-mediated and non-representational access to *the digital*.

Thank you.