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BOOKS

VOL 20 NO 2 BOOK EDITORS LANFRANCO ACETI & PAUL THOMAS

EDITORIAL MANAGER ÇAĞLAR ÇETİN

In this particular volume the issue of art as interference and the strategies that it should adopt have been reframed within the structures of contemporary technology as well as within the frameworks of interactions between art, science and media. What sort of interference should be chosen, if one at all, remains a personal choice for each artist, curator, critic and historian.

# INTERFERENCE STRATEGIES

# Interference Wave

# DATA AND ART

*The organism that would be the supposed subject and intentional origin of forces is an effect of impersonal potentials, and it is precisely the technical object that can expose the power of potentials to act beyond the organism's capacities.*

— Claire Colebrook <sup>1</sup>

## DATA, DISPLAY, MODULATION

**The artist working in the digital medium must attend to the intrinsic qualities of the digital medium.**

Stiegler, Kittler, Manovich and Hansen, among others, have all meditated on what I characterise as the separation between digital data and its display. These writers tend, broadly, to characterise this separation in terms of technics and media. Such a characterisation owes much to the Platonic concepts of *amnesia* and *hypomnesia*. Kittler takes the dichotomy to its extreme and posits that there are no longer any media: “with numbers, everything goes [...] a digital base will erase the very concept of medium.” <sup>2</sup> Kittler wants to move beyond the concept of the medium as a result of digital convergence because it transcends differentiation between media, a differentiation that is constitutive of the concept of media. Without differentiation between different media, there are no media, and since the convergence of all media into the digital removes any differentiation between media, in the digital era there are no media. Thus, when he concedes that there ostensibly still *are* media in our world,

## A B S T R A C T

*This article investigates the nature of digital data as a medium for art. Specifically, what are the qualities and specificities unique to the medium of digital data, and how can artists working with this medium create work that cannot be created in any other medium? References are made to Friedrich Kittler, Mark B. N. Hansen, Marshall McLuhan, Gilles Deleuze, Anna Munster and Claire Colebrook to establish a bivalent ontological model of digital data. This bivalence is described in terms of ‘data’ and ‘display,’ where ‘data’ exists in an indeterminate state inaccessible to human perception until a determining operation is performed to modulate the data into a ‘display’ state, where ‘display’ does not necessarily imply visual display. Such a model suggests, in McLuhanist and Deleuzean terms, a medium that retroactively virtualises all previous media. This model is compared in detail to Gilbert Simondon’s ontological model of transductive individuation. Finally, modulation - in the form of parameter selection - is presented as the defining work of the artist in the digital medium.*

he sees them as comprehensible in McLuhanist terms, where the content of one medium is always another medium. The digital is singular, post-convergent, formless and plastic, and the differentiation that constitutes media occurs when digital data is modulated into some display state.

This way of thinking about the digital can be of practical use to the artist working with digital data. It has the advantage of unproblematically incorporating McLuhanist considerations - not only in what McLuhan calls the “rear-view mirror” operations that constitute so much of digital culture today, but also in the sense that McLuhan’s concept of media-as-content

itself becomes content in the digital medium. <sup>3</sup> So, for this discussion of the role of art and interference in the digital era, it is important to recognise the distinction between plastic, formless, generic digital data and specific instances of display, where digital data is modulated from its state of data-as-data into a state of display, such as when a digital photograph is visually displayed on a screen, or a digital audio recording is audibly displayed through speakers. Before this act of modulation into display, there is no possible distinction between the photograph and the sound, since they are both generic, formless digital data. This act of modulation - between data and display - is the work of the digital artist.

by

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Mark Hansen argues against Kittler's extreme version of the consequences of digitisation, seeing it as an overly literal, or formalist, reading of Claude Shannon's foundational work in information theory, where information is separate from meaning. Hansen is keen to show that the differentiation of media is a more complex assemblage involving what he calls *embodiment*, in the sense of being "inseparable from the cognitive activity of the brain."<sup>4</sup> In this, he relies partially on an alternative theory of information, contemporaneous with Shannon's, espoused by Donald McKay, where what we might call the non-technical interpretation of information is inseparable from its technical structure. But Hansen does not deny the technical fact of the levelling nature of digital data, and nor does he deny the subsequent generic translatability of digitised media. Rather, he is attendant to the framing, or subjectification, that he sees as a necessary driver of the consciousness that perceives the modulated display of digitised data. In some ways, Hansen's attitude can be seen as extreme as Kittler's, in that neither are prepared to consider the digital medium as a medium in its own right – a move that would allow them to consider the formal and intensive qualities and implications of the medium, using McLuhanist techniques to investigate what can be done in this putative new medium that cannot be done in any prior medium. Even though he, like Kittler, acknowledges that convergence into the digital renders all prior media undifferentiable, Hansen's privileging of the image is perhaps why he doesn't logically extend the McLuhanist gesture all the way to the conclusion that the digital convergence not only profoundly enacts W. J. T. Mitchell's assertion that "there are no visual media,"<sup>5</sup> from the constitutive side instead of the "sensory modality" standpoint, but so totally incorporates all prior media as to subsume the very concept of differentiated media into a recursive subset of itself, and, *contra* Kittler, it does this as a medium, contributing operations in excess of all the media and semantic sources

being digitized, constituting a whole that is comprised of all prior media plus the digital excess, a whole that completes McLuhan's project while offering a new medium that differentiates itself through its own constitutive, ontological, excess.

We can identify two elements and one principle that constitute the digital medium as a medium. The two elements are data and display, and the principle is modulation. Working with digital data is a constant process of modulating data back and forth between a display state and the state of data-as-data. Display does not necessarily mean *visual* display, but it may, and in this sense, 'display' may be thought of as 'expression', or perhaps even 'actualisation'.

Any distinctions between discrete media and any distinctions between discrete mediatic actions are collapsed in the digital. All media are virtualised in the digital, and then simulated in display, so that any distinction between them holds only in a nostalgic sense, in the rear view mirror. Precisely because the digital contains all prior media, virtualised as content, it is possible to analyse these media separately, but only nostalgically, in a McLuhanist manner, and only when modulated into a state of display, enacted as a simulation of media. As Justin Clemens and I put it in Thesis 4 of our *Seven Theses on the Concept of Post-Convergence*:

*'All that is solid melts into data.' Alternatively: all is data. This is evidently an ontological thesis. What matters is data, but data isn't actually anything. Data is data. Data is absolutely not a phenomenological thing. It cannot be experienced as such, like Aristotelian prime matter. Unlike Aristotelian prime matter, however, we can manipulate data with ease; in fact, it is integrally available as manipulable. Marx claimed that human beings do indeed make history, but not as they please; today, we*

*make data and just as we please. Data is us. However, this is not the pure freedom that it may seem, nor does it lead to any triumph of the will. This is because data is only available to finite humans as filtered, as interpretation. These interpretations are, precisely, inscribed in display (whether audio, visual, haptic, what have you). Whatever is inscribed in display is always already modulated, and this modulation emerges from 'a formless soup of meaninglessness,' that is, a hyperchaos of data.*<sup>6</sup>

The invitation, therefore, for the artist working in the digital realm, is to recognise that the work is modulation. A significant factor in the work of modulation is parameter selection. But this post-convergent medium virtualises everything, and so the concept of parameter selection itself becomes a parameter to be selected, at the same time as retroactively highlighting the latent cruciality of parameter selection in all prior media. This potentially overwhelmingly complex situation can elicit an extreme rear-view-mirrorism in practice, and such is the situation we often see with deterministic data visualisations and data-driven visual artworks.

#### VIRTUAL ART

In calling on the concept of the virtual, I am not equating it with technology or the digital, though of course in the contemporary era it rings with echoes of popular usage in the sense of a 'virtual friend' or 'virtual sex' or 'virtual environment.' Rather, I am evoking the Deleuzian sense that Anna Munster, in her book *Materializing New Media*, describes thus:

*[T]he virtual dimension for corporeal experience evoked here lies in the way it poses the potential for embodied distribution as a condition of experience for information culture (original emphasis) by*

*dislocating habitual bodily relations between looking and proprioception. Virtual forces are vectors that pulse through the contours and directions of matter.*<sup>7</sup>

In a fine study of the nature of the relationship between the digital and the material, and the virtual and the actual, Munster talks of these inter-relationships as "actualizations of virtual subjectivity,"<sup>8</sup> and encourages us to see virtualisation as "an expanding and contracting field of differentiation."<sup>9</sup> This is a very useful tool for understanding the nature of the digital medium in relation to Kittler's proclamation of the movement beyond medium. Her convincing and nuanced argument can also be seen as extending McLuhan's famous extensions in a richer and more practical way than Hansen or Kittler, and is particularly useful for artists or practitioners of the digital attempting to come to terms with its intensive, and extensive, qualities and specificities. Her argument allows us to comprehend the ostensible contradiction between the collapsing, or levelling, nature of the digital and the specific differentiations required to interact with it. It does this by seeing all points of the digital - semantic sources, technical protocols and parameters, specific display instances and subjectification - as interdependently transformative negotiations of flows rather than assimilations of one thing into another. This may offer an approach to thinking the capacities of the immanently digital entity that differentiates both within and without its material manifestation, that both is and is not digital, without a semantic material provenance.

In a similar vein, but in specific relation to images and visual art, Claire Colebrook calls on Deleuze and Guattari's concept of *desiring machines* to understand the nature of the undifferentiated digital. She writes:

*It is naive and uncritical to see the analogue as a pure and continuous feeling or bodily proximity that is then submitted to the quantification of the digital, a digital that will always be an imposition on organic and vital life. There is, however, an in-organic mode of the analogue that is not a return to a quality before its digital quantification, but a move from digital quantities or actual units to pure quantities, quantities that are not quantities of this or that substance so much as intensive forces that enter into differential relations to produce fields or spaces that can then be articulated into digits.*<sup>10</sup>

Both Munster and Colebrook are trying to think about the consequences of the digital in terms of Deleuze's concept of life beyond the organic. As Colebrook characterises it, Deleuze thinks of "a technical or machinic potentiality that enbaes organic life,"<sup>11</sup> and both she and Munster can see a relationship between this and the operations of the digital, without equating the digital with this putative potentiality. In this, they (and Deleuze) are influenced by the thought of Gilbert Simondon, whose philosophy of ontogenesis requires us to "understand the individual from the perspective of the process of individuation rather than the process of individuation by means of the individual."<sup>12</sup> He talks of a preindividual state from which the individual being emerges but, in its individuation, not only "does not exhaust the potentials embedded in the preindividual state,"<sup>13</sup> but continues to exist in a state of relations with its milieu, a milieu that includes the preindividual state.

Therefore, according to Simondon, being "does not possess unity of identity which is that of the stable state in which no transformation is possible: being possesses transductive unity."<sup>14</sup> This concept of transductive unity, or transduction, is crucial to Simondon's philosophy:

*By transduction, we mean a physical, biological, mental, or social operation, through which an activity propagates from point to point within a domain, which is operated from place to place: each region of the constituted structure serves as a principle of constitution for the next region.*<sup>15</sup>

This aspect of Simondon's philosophy can be a useful tool for analysing the operation of the digital, particularly in the post-convergent terms of data, modulation and display. When existing as digital data, we can see a preindividual state from which a medium (e.g. a "photograph") individuates or, in the terms we are discussing, is differentiated by being modulated into a display state. This state of display, though, has a "relative reality, occupying only a certain phase of the whole being in question,"<sup>16</sup> crucially in ongoing symbiotic relations with its digital milieu, comprised of all the conceptual (protocols, software, etc) and physical (electrical, ferromagnetic, etc.) interactions that go to make up a working digital system.

As alluded to above, in the quote from Justin Clemens and myself, what is of interest to artists (and philosophers) is that, with the digital, we are eminently able to manipulate these systems of relations and individuation. More precisely, we are able to actively engage with these systems. In this sense, we can see alignments between Simondon's concept of transduction and what I am calling modulation.

It is important to note that Simondon's philosophy is in no way a surrender to cybernetics or information theory, and by following Simondon we are able to avoid a crude reductionist view of the digital and its relation to life. As much as he was interested in the thinking of the first wave of cyberneticists, he was equally alarmed at their attempt to rationalise all life in terms of the working of the machine – such a mechanistic view entirely goes against Simondon who

is, if anything, more likely to see a machine in terms of the working of an organism. But this would be a gross oversimplification of Simondon's ontological thinking, which entirely rejects any form of dichotomous thinking or substantialist division, along the lines of mind/body or human/machine, whilst still being perfectly capable of acknowledging the difference between these things.<sup>17</sup> Simondon sees no opposition between biology and technology, rather they are a continuation of each other. In this sense, there is a resonance with McLuhan's "extensions," but Simondon is far more egalitarian, seeing no hierarchy where human activity is more important or genuine than technological activity, a determinism which is perhaps implied in McLuhan's notion of extensions as applied to media.

Simondon's philosophy is very concerned with what we might call the recursive or even reticulated nature of systems, i.e., that transduction is a constantly cooperative process where elements influence and are influenced by each other and their milieu in interaction, which is a genuine *interaction*, rather than a one way line of cause and effect, each interaction both subject to and contributing to the nature of the system and thus the individual itself (and it is easy to see how such a philosophy appealed to Deleuze). So it is with modulation of digital data into a display state, a constantly recursive process of interaction between a myriad of physical (electricity, ferromagnetic particles, plastic, metal, silicon, nervous system, hand, eye) and conceptual (protocols, software, ideas, intentions) elements each engaging in a participatory process of individuation. Digital data is constantly being modulated into a display state in order to engage with another element in the system, whether that element be human or technical, then remodulated back into digital data, only to be modulated into another display state and so forth. With every modulation occurs a modification, of every element, of the interaction itself, of the modulation itself, a recursive, reticulated system of

de- and re-modulation, or what Simondon calls "recurrent causality,"<sup>18</sup> crucially engaged with and engaging its internal and external milieu.

We might think of this, as alluded to in the title of this essay, as a constant process of interference, a standing wave of interference. The artist hoping to work with the digital, and hoping to effect some kind of interference with the received values and standards of their milieu, must attend very closely to this process of modulation since it is the only action available to them that can truly be called "digital," without rehearsing pre-digital notions of art that scan only in the rear view mirror, and therefore are more likely to confirm rather than question the contemporary hegemony of libertarian digital capitalism. Such a hegemony relies on pre-digital notions, particularly of the individual, and encourages users to see the digital through the rear-view mirror. This is in order to distract from the Simondonian processes the hegemony itself engages with to exploit its worldwide workforce of individual users, bewitching them into tirelessly labouring to produce its commodity (digital data), not only for free, but enthusiastically. This is of course exemplified by the so-called personalisation movement, a drive towards total solipsistic consumption-as-production. This shows that the processes that Simondon identifies, and that are mirrored in the digital, are not necessarily anthropocentric ideological processes, but can be utilised towards any pre-digital anthropocentric ideology by engaging with its processes to exploit Cartesian subjectivity or any other dualist or substantialist ideology that sees technics as external to the human experience. Such is the method employed mercilessly by contemporary global digital capitalists, with outrageous hegemonic success. Thus it is beholden upon artists, wishing to attempt to interfere with such hegemones, to investigate the implications of genuine engagement with these Simondonian digital processes, inserting themselves by experimenting with param-

eter selection, thereby participating in the modulation process without succumbing to a subjectivist attempt to determine the teleology of the work.

In other words, since the digital opens up Simondon's concepts of technical beings and individuation, the artist must try to enter into relations with this digital process of modulation, allowing themselves, their ideas and their will to modulate – for example, through parameter selection – and be modulated. This means being mindful of avoiding any teleological impulses towards an artwork, rather opening up the work process to the recursive affectivity of the digital, so that the process of art in the digital is not formulated in terms of individual artworks. The process should be a part of the recursively relations-based nature of digital systems, engaged completely in the recurrently causal modulation process. In this sense, the artist's process becomes a node in the reticulated process of modulated individuation that characterises the digital process, constantly in changing, influencing and influenced relationship with the process and its milieu, which in this case, since the artist's process is an element within the system, includes both the internal and networked workings of the digital system as well as the artist's own milieu, which presumably includes the artist's social context, history and desires – desires both individual and social.

Colebrook's very important point about the inorganic mode of the analogue reminds us of the crucial difference between the digital and the numeric or mathematical. Kittler, Hansen and Deleuze all practice this conflation of the digital and the numeric. In fact, the digital is not numeric, it is purely binary, an enacted logic of switches. This widespread conflation is perpetuated by the popular misconception of the digital being constructed from “zeroes and ones,” which is in fact simply a symbolic placeholder for the boolean logic of on/off or yes/no or is/is-not. Once we ac-

cept the numerical, or mathematics, as simply another parameter selection used to effect the modulation between data and display, we may be able to comprehend the move to pure quantities and even think the relationship between the contemporary technical interdependence of virtual/material and the Deleuzian interdependence of virtual/actual. In other words, we will have moved closer to Munster's exhortation to see the virtual as expanding and contracting fields of differentiation. In the digital, we as artists may see a tool for consciously or explicitly engaging with Simondon's transductive process of individuation where the individuated remains in dynamic interaction with the pre-individual, which is never exhausted.

#### IMMANENTLY DIGITAL ENTITIES

We have established that there is no longer any meaningful differentiation between discrete media, except as they relate to a display state. Now we can analyse the display of digitised entities that have a recognisable material (non-digital) provenance. For example, it is easy to see much contemporary data visualisation as a straight forward modulation of data into the visual display register using parameters selected along the lines of McLuhan's rear view mirror. Given that this act of modulation is already a formalised kind of interference, it is clear that to achieve the kind of interference that might also be considered an artist-led disruption (itself a rear view mirror kind of concept), the artist must take care to select parameters that cause the modulated display to visually question its own display. This might include questioning the veracity of the data's provenance or the assumptions made in the digitising of the data in the first place, or the scale of the data and so on.

But what of immanently digital entities? In other words, digital entities that have no recognisable se-

mantic material source. This is the question that my colleague, John McCormick, and I are investigating in our ongoing project called *Reproduction*. The work involves experimentation in audiovisual, performative, evolving, virtual entities spawning and reproducing in virtual environments, capable of intercommunication with the material world via various systems of motion and data capture. Loosely based on principles of artificial evolution, the parameters that we as the artists initially selected are, rather than the standard artificial evolution parameters like strength and fitness, all audiovisual performative parameters like red, green, blue, opacity, rhythm, timbre, tempo, tone (pitch) and so on. The entities evolve, reproduce, live and die over thousands of generations according to a constantly emergent evolution of these crude parameters that is informed, but not determined, by both their interaction with humans in the material world and with their interactions with each other. In other words the original parameter set becomes, after the first generation, virtualised content for the next emergent generation. All the while, the entities are organising (or perhaps socialising) and improvising movements and “songs” amongst themselves, whilst observing and improvising with any human visitors to their “space.” The space in this case means both their digital virtual environment (accessible by humans via an online multi-user environment) as well as the physical space of wherever the work happens to be exhibited. In the latter case, motion and data capture are used by the entities to perceive humans, while a modulated audiovisual display allows humans to perceive the entities. Our desire, as artists, is to engage - using sound, music, movement and dance - in what we might call a “genuine” improvisation with these digital entities, by which we mean the human and digital performers share equal responsibility and value in the emergence of the improvised performance, dynamically building a shared performative vocabulary by learning from each other's nuances, gestures and performative suggestions.

In this way, we are attempting to enact some of the possibilities raised by Simondon's ontogenetic philosophy of technical being that is in a recurrently causal, constantly evolving, relationship with human beings where, while remaining ontologically distinct, neither has primacy over the other.

We might be asking, at the insistence of Kittler, if there is life beyond the medium. The inter-relationships of flows investigated by Anna Munster, or the pure quantities posited by Claire Colebrook may be at work in the emergent and evolving persistent performance of *Reproduction*. Certainly, Munster calls very explicitly for media artists to move beyond what she calls “the twin premises of disembodiment and extension in space.”<sup>19</sup> Accordingly, this work attempts to improvise in real time an enactment of these beyonds. And since we have established that the image cannot exist in the digital, perhaps we can leverage Colebrook's thinking when she writes “we might aim to think beyond the body as an extended substance receiving the world only in terms of its bounded actuality? An image can be experienced as such, not as a proper body or imperative.”<sup>20</sup>

Of course it is possible to rationalise any interaction with or display of these entities in terms of the original human-selected parameter set, but this is no more meaningful than saying that any living material organism is nothing more than its originary DNA combination, and this is the potentially reductionist danger that informs some contemporary thinking around embodiment, framing and subjectification, especially in relation to the digital. This is where Simondon's philosophy, on its own and in relation to its influence over Deleuze, Colebrook and Munster, can come in very useful, so that there is a chance to rigorously examine the potential, in our interactions with the immanently digital, for the emergence of what Claire Colebrook calls “sense beyond the actual.”<sup>21</sup> ■

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