Digital Image

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> *For the essence of technology is not anything human. The essence of technology is above all not anything technological. The essence of technology lies in what from the beginning and before all else give food for thought.*[1]

Introduction

Until recently critical approaches to photography had one thing in common: they all shared in the implicit and incontrovertible understanding that photographs are a medium that must be approached visually; they took it as a given that photographs are there to be looked at and they all agreed that it is only through the practices of spectatorship that the secrets of photography can be unlocked.[2] Whatever subsequent interpretations followed, the priority of vision in relation to the image remained unperturbed. This undisputed belief in the visibility of the photograph has such a strong grasp on theory that it imperceptibly bonded together otherwise dissimilar and sometimes contradictory methodologies, preventing them from noticing that which is the most unexplained about photography: the precedence of looking itself. This self-evident truth of visibility casts a long shadow on photographic theory because it blocks the possibility of inquiring after everything that is invisible, latent and hidden. As an example of this amnesia of the invisible consider for instance the extent to which the latent image – a prerequisite for the formation of an ordinary photograph – is all but ignored by

[1] Martin Heidegger, *What Is Called Thinking?* Trans. J Gray Glenn (New York: Harper Collins, 2004). 22

[2] As an example of this approach consider for instance the following typical statement: "Every photograph is the result of a physical imprint transferred by light reflections onto a sensitive surface. The photograph is thus a type of icon, or visual likeness, which bears an indexical relationship to its object." Rosalind E Krauss, *The Originality of the Avant-garde and Other Modernist Myths*. (Cambridge, Mass.; London: MIT Press, 1985), 203. In recent years there appeared a small number of texts that divert attention from the visible to questions of movement and algorithmic processing. For instance see: Sarah Pink. "Sensory Digital Photography: Re-thinking moving and the Image." Visual Studies 26, no. 1 (2011): 4-13, and William Uricchio. "The Algorithmic Turn: Photosynth, Augmented Reality and the Changing Implications of the Image." Visual Studies 26, no. 1 (2011)

photographic theory.[3] However, the triumph of the digital image as the contemporary form of photography forces a reevaluation of visibility because it is making it plain for all to see that the visible cannot account for everything that is taking place with images that begin their life as binary data, then processed algorithmically and driven to various points across the network not as individual pictures but as packets of data.

This paper considers the ontological significance of data and metadata in relation to image economies of the web.[4] Its argument in a nutshell is that the digital image cannot be understood without taking stock of the delicate workings of data because the image is an outcome of processes that are driven by algorithms rather than by aesthetic decision-making and therefore cannot be comprehended through the holy trinity of representation, the index and the punctum. This is not to say that the dependence on algorithms renders the digital image somehow immaterial or inhuman, but that in becoming computational it partakes in a different kind of logic to the one underpinned by representation and identity.[5] Situated, as it

[3] The latent image occurs when photographic film is exposed to light and the action of the charged light particles on the silver halide grains forms sites of metallic silver. The changes to the film as a result of the exposure are on a molecular level and require subsequent chemical development in order to become visible to the eye. From the moment of exposure and up to the subsequent chemical development the latent image has to be kept in light-tight film canisters or dark-slides until it is ready to be developed. Developing the film destroys the latent image since it converts silver halide crystals to metallic silver grains and produces the film negative. Given the fundamental importance of the latent image to the process of making a photograph, it is thought provoking that it is habitually omitted from the accepted narrative of photography. While the latent image has very specific meaning in photographic chemistry and physics as the invisible image left on the light sensitive surface by exposure, histories of photography rarely devote more than a passing reference to it, and while its importance to the photographic process is usually acknowledged on a technical level, photographic theory has nothing to say about it, making it doubly invisible. Michel Frizot's monumental 'New History of Photography' states that that latent image 'remains fundamental to the photographic process' yet it addresses it in a single paragraph. [Michel Frizot, *New History of Photography*. trans. Susan Bennett, Liz Clegg, John Crook and Caroline Higgitt (Paris: Könemann, 1998), 61]. Thus, the latent image is both 'fundamental' and there is nothing to say about it. It is the invisible image that has been forgotten. The reluctance of theory to talk about this primordial state can be considered symptomatic of the desire to focus on the visible and tangible object-image and ignore the invisible without questioning the basic premise of the distinction itself.

[4] Recent revelations about the scale of data gathering from everyday online activities by governmental and private organizations highlighted the key role played by metadata in the construction and the functioning of the modern state. See for example the reports by the NSA whistleblower Edward Snowden. http://www.theguardian.com/world/video/2013/jun/09/nsa-whistleblower-edward-snowden-interview-video (accessed 4 August 2013)

[5] "[A]lgorithms are not autonomous objects, but they are shaped themselves by the pressure of external social forces." Pasquinelli, M. "Machinic Capitalism and Network Surplus Value: Towards a Political Economy of the Turing Machine."

http://www.matteopasquinelli.com/docs/Pasquinelli_Machinic_Capitalism.pdf.

were, on the threshold between the visual and the computational, metadata enables new topologies of the image, new temporalities and multiplicities, which present a challenge to the art-historical models of conceiving the image in visual terms as an archival or curatorial object. As photography becomes an encoded discourse, this paper suggests that the turning away from the visual towards the mathematical and the algorithmic establishes undecidability – rather than representation – as a key property of the networked image.

1. What is metadata?

Whilst one common definition of metadata is 'data about data' this characterization is not very helpful because it does not clarify metadata's role as a mediator between humans and computers. At its most basic, metadata offers the ability to append linguistic signs to an image (or other data object), to facilitate its classification, archiving, retrieval and to indicate attribution (authorship, ownership, conditions of use). With respect to photographs, metadata comes in two categories: descriptive metadata which is mechanically generated from such details as date, location, camera make, owner, keywords, and is carried within the file; the second type is collected as a valuable by-product of interaction with the image (tags, comments, ratings, number of viewings) and is stored independently of the image.[6] By enabling the exchange and structuring of online communication, metadata is crucial in shaping information economies and informs the efficient operation of search engines. For this reason, metadata's production underpins the future of the Semantic Web: an utopian/dystopian fantasy of a machine-readable web in which the prophecy of an automatic processing of all information by non-human actors becomes a reality.[7]

Metadata operates between the algorithmic, computational world of the computer network and the physical-biological-social world inhabited by humans, forming a layer of connective bio-computational tissue that translates social values into something computers can quantify and process.[8] Advances in pattern recognition algorithms notwithstanding, it is still the case that the computer cannot accurately recognise what the photograph contains. By

[6] Daniel Rubinstein. "Tag, Tagging." Philosophy of Photography 1, no. 2 (2010): 197-200

[7] The production of meticulous and semantically unambiguous metadata is crucial to the Semantic Web ('Web 3.0'), Tim Berners-Lee's vision of "a web of data that can be processed directly and indirectly by machines."

[8] Pasquinelli, M. "Machinic Capitalism and Network Surplus Value: Towards a Political Economy of the Turing Machine." http://www.matteopasquinelli.com/docs/Pasquinelli_Machinic_Capitalism.pdf.

re-writing the image as machine-readable text, metadata facilitates the identification, discovery, retrieval, and dissemination of images online. The social and political functions of this image-data hybrid are not determined by its visual content but by the tags and comments that tell the search engines how to classify, catalogue and sort it. The importance of this data to the economies of images online is due to two main factors: first, metadata tags are simple semantic objects, usually normal English words that allow the computer to 'see' the image and to interact with it. Second, meta-tagging is a process that erases the familiar fixed hierarchy between author, audience and subject suggesting instead a variegated field of mutable relations that are figured by the instability of meaning and by the heterogeneity of versions and narratives. These two characteristics of metadata suggest a form of political agency that is fractured, unstable and non-hierarchical, constantly problematizing the relationship between authors and readers of images and requiring a form of political ontology that can account of power exercised not vertically through representation but horizontally through the controlling effects of the algorithm. Hence, to conceive of metadata simply as data about data is to overlook its potential to contaminate, mutate or change the direction and context of the image, and also to ignore the potential for the harvesting of personal information stored within it. For instance, it have become known that the euphemistically named 'security agencies' that harvest information from email service providers are more interested in the metadata associated with emails then with the content of the communication.[9]

Another widely held belief is that metadata is a reinvention of the archival paradigm; an aid to the cataloguing, storing and curating the web. In fact, metadata does the opposite of cataloguing since it brings forward the irredeemable instability of meaning of the networked image as at each moment, and in each new instance, the tags and annotations that comprise metadata can be modified, deleted, rewritten and changed. In the past, concerns about manipulation of pixels caused people to doubt the veracity of the digital image, however manipulation of metadata can have much more dramatic and far-reaching consequences as it not only affects the placement of the image in search queries but also can radically modify what the computer 'sees' in the image. Small changes to image's metadata can completely

[9] See for instance: http://www.newscientist.com/article/dn22511-how-metadata-brought-down-cia-boss-david-petraeus.html#.UgwG2FO9yEw (accessed August 14, 2013). For a visualization of personal information that can be obtained from email metadata see: http://www.boston.com/2013/06/29/SZbsH6c8tiKtdCxTdl5TWM/singlepage.html (accessed August 16, 2013)

redefine its context and circulation: for instance, a picture of a dog tagged as 'cat' will appear in searches for cats but will be invisible in searches for dogs. In relation to the image economy of the web this is an illustration of the way the semantic capital of the networked image is determined by a range of signals that supplant previous – visual – economies of the image.

2. The spectre of representation

There never was a 'clean break' with the analogue past. The digital image is based in part at least on old technologies and old means of production. For instance, the lens at the front of a digital camera is exactly the same piece of glass that graced film cameras before the invention of digital photography (some digital cameras are even designed to accept those old manual lenses). In addition, the digital image is often said to resemble an analogue photograph: comparisons of grain to pixels abound to prove that the digital image can capture just as much detail – if not more – than the film photograph. However, drawing these parallels between digital and analogue processes risks missing the paradigmatic shift of digitality, which both overcomes and transfigures the limits of representation. If the image on the computer screen seems to resemble the look of a traditional photograph this is mostly due to the work of computational processes designed to make these data packages look familiar and homey. Modern digital cameras offer the ability to recreate the aesthetics of photographic films: with a push of a button one's snaps can look like they were shoot on Velvia© or Provia©. But imitation does not stop there: the totality of the digital image is in fact a skeuomorph – its adherence to the visual conventions of photography is simply an ornamental decision taken by the creators of the processing algorithms, as the data captured by the camera sensor could be just as easily output as something completely different: a string of alphanumeric characters, a sound or even remain unprocessed as binary data.[10]

Even the notion that the digital image is a self-contained entity is misleading: one of the characteristics of the digital age is that all images are potentially linked through communication networks which distribute, mediate, assemble and re-assemble electronic signals that might or might not appear as a picture at some point of a perpetual cycle of packaging and re-processing of data. As all the images are drawn from the same infinite

[10] Daniel Rubinstein, and Katrina Sluis, "The Digital Image in Photographic Culture; Algorithmic Photography and the Crisis of Representation." In The Photographic Image in Digital Culture. 2nd Edition ed. Ed. Martin Lister (London: Routledge, September 1, 2013), 22-40

torrent of networked files, to some extent it is possible to speculate that there only ever was and only ever will be one networked image. The atomistic model that sees each picture as an autonomous entity falls apart in the face of the perpetual circulation of data that only occasionally appears as discrete images. If taken seriously, these considerations suggest that the essence of the photographic image online has little to do with the semiotics of representation, economy of signs, signifiers and indices, rather the truth of the image has to be found in its inherent incompleteness and the constant bifurcation into divergent but interconnected narratives. Therefore the digital image consists not in reflecting external reality but in showing the extent to which reality itself is inseparable from the computational processes that shape it. Thus the arrival of the digital image is first and foremost overwhelming; images do not appear as singular, individual or discrete; they do not have borders that separate one image from another, rather data is distributed according to certain rules, sending some of it to the screen as an image, some of it to the speakers as sounds and some of it to the printer as text. These 'images' traverse the networks not as snapshots but as dynamic arrays of electronic signals and packages of data. Hence the necessity of another language with which to speak of the image. It gets worse, as what is required is not only another vocabulary, but also another ethical framework with which to conceive of the image as political force. The ethics of traditional photography is inseparable from the assumption of correspondence between the image and some form of reality of which it is said to be an imprint, but in an environment in which correspondence is replaced with predictive algorithms and computation it is unclear what, if any, is the ethical stance of the image.

The demand for a language that allows speaking about images without excessive reliance on such categories as form–matter and subject–object is of course not new. In the context of visual culture one could trace its genealogy at least to the work of Walter Benjamin, who throughout his life meticulously opposed all forms of idealist aesthetics. Given Benjamin's place in photography theory it is perhaps not surprising that his work helps to articulate some of the issues raised by the algorithmic turn in photography, however it is not his writings on photography that help to come to terms with the liminal space of the networked and the processural image. Specifically, it is not *The Work of Art in the Age of Mechanical Reproduction* essay that we turn to – despite this being one of the most often reproduced texts in photographic literature – because it offers a rather crude opposition

between technology and aura.[11] Instead, we turn to his sprawling investigation into the crisis of experience brought about by the proliferation of technology and the technology of proliferation in *The Arcades Project.* For Benjamin of *The Arcades,* the most astounding aspect of modernity is in the way it both demolishes the recent past and recovers forms of pre-rational and pre-historic knowledge, so that the peculiar dialectic of modern technology paradoxically points towards the past as well as towards the future:

> "Corresponding to the form of the new means of production, which in the beginning is still ruled by the form of the old (Marx), are images in the collective consciousness in which the new is permeated with the old. […] what emerges in these [...] images is the resolute effort to distance oneself from all that is antiquated–which includes, however the recent past. These tendencies deflect the imagination […] back upon the primal past. In the dream in which each epoch entertains images of its successor, the latter appears wedded to elements of primal history <*Urgeschichte*>–that is, to elements of classless society. And the experiences of such society–as stored in the unconscious of the collective–engender, through interpretation with what is new, the utopia that has left its trace in a thousand configurations of life, from enduring edifices to passing fashions."[12]

What Benjamin discerned in the shopping arcades of Paris was not only the worldwide network of commerce; the global system of exchange that defines, catalogues and integrates all parts of the world into something like a living organism made of glass and iron and an image of a society posited on the universal contract as the highest law. He also saw among the wrought iron and the curved glass how, by compressing the world into a single point, this new globalized modernity undermined the foundations of its own metaphysical

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[11] One of the most damning criticisms of the *Work of Art* essay comes from Theodor Adorno: 'Benjamin's theory of the artwork in the age of its technical reproduction may have failed to do full justice to this [locating the irrational within the rational – DR]. The simple antithesis between the auratic and the mass-reproduced work, which for the sake of simplicity neglected the dialectic of the two types, became the booty of the view of art that takes photography as its model and is not less barbaric than the view of the artist as creator.' Theodor W. Adorno, *Aesthetic Theory*, ed. Rolf Tiedemann and Gretel Adorno. Trans. Robert Kentor-Hullot (London: Continuum, 1997), 72. It is however worthy of note that Benjamin authored a second version of the same article, translated to English as *The Work of Art in the Age of Its Technological Reproducibility*, in which some inroads are laid for recovering the auratic within the technological. Walter Benjamin, *The Work of Art in the Age of Its Technological Reproducibility, and Other Writings on Media*, trans. B. Doherty and M. W. Jennings (Belknap Press, 2008).

[12] Walter Benjamin, The Arcades Project. Trans. Howard Eiland and Kevin McLaughlin (Cambridge, Mass.; London: Harvard University Press, 2002), 4

order that was posited on linear chronological time, flat spatiality, rational logic and the clearest of distinctions between spirit and matter, Image and reality. As Benjamin observed, the age of global networks and synthetic materials suggests a move beyond systems of representation into a plastic space that demands not only a new aesthetic regime but also a new political ontology. The computer networks of silicon and fibber-optic cables parallel this move beyond representation; it is simultaneously a move forward towards universal control and global information capitalism and a move backwards, in the direction of the classless, non-hierarchical existence in which knowledge is unconscious, sensuous, non-reflexive and intuitive.

3. The undecidable is Real

Whilst it might sound counter-intuitive to claim that the digital image is undecidable, it is salutary to remember that undecidibility is one of the key principles of computer theory that sets theoretical limits to what can be computed. Described by Alan Turing in 1937, this principle (also known as The Halting Problem) places limitations on the ability of computers to make intelligent decisions and states that some computational problems cannot be decided by an algorithm and are unsolvable in principle.[13]

As a conceptual formulation that limits certainty and introduces an element of chaos and indeterminism, undecidability is a non-dualistic entity that bypasses such oppositional pairs as true-false and form-matter in favor of process of continuous deferral and a state of irresolvable complexity. The algorithmically processed digital image is undecidable to the extent that material processes involved in its production have less to do with Cartesian perspectival universe with its reliance on the horizon line and the optical vanishing point and more with Gödel's undecidability theorems, Heisenberg's uncertainty principle and the paradoxes of Turing machines.[14] At the very least, the merging of the visual image with

[13] Alan Turing, "Computability and λ-Definability," The Journal of Symbolic Logic, 2 (1937): 153–163. The undecidable arguments were put on the table as early as 1927 in the seminal work of Werner Heisenberg on uncertainty. Kurt Gödel's undecidability theorems were published in 1931. However, it was Turing who realized what undecidability means for computing as the underlying principle of his concept of recursive algorithm. (I am grateful to Prof. Johnny Golding for pointing out to me this genealogy of the undecidable.)

[14] On the connection between photography and quantum physics, see: Daniel Rubinstein, "The Grin of Schrödinger's Cat; Quantum Photography and the Limits of Representation." In *On the Verge of Photography*. (Birmingham: ARTicle Press, 2013). Also available online at: . . .

computation suggests that digital images move along two axis at once: One is the household representational, in which the image maintains some sort of connection with an external reality, the other is the strange and untamed world of multiplicity, proliferation and undecidability in which there are no right or wrong answers because the Archimedean point of external reality has been replaced with self-referential replication. The rich conceptual potential of undecidability had an electrifying effect on literary and philosophical investigations seeking to confront classical representational schemas. [15] In the late philosophy of Jacques Derrida, for instance, undecidability acquires political significance because it allows for a possibility of radical freedom expressed through the act of writing.[16] As a kind of *pharmakon* – a drug that can be either a poison or a cure – it breaks away from teleological unfolding and in so doing it is exposing the inconsistency of rational or representational logic. As Isabelle Stengers pointed out, the evacuation of the *pharmakon* from the scientific and philosophical discourse is symptomatic of the desire to purge the discourse from any traces of ambiguity, instability and uncertainty: "What does seem to make us unique […] is the intolerance of our tradition in the face of this type of ambiguity, the anxiety it arouses. We require a fixed point, a foundation, a guarantee. We require a stable distinction between the beneficial medicament and the harmful drug. Between rational pedagogy and suggestive influence, between reason and opinion."[17]

It is therefore ironic that it is precisely the technologies of computation that are bringing to light the abyssal logic of the image by exposing the irredeemable incompatibility between certainty and computation. Accommodating the unknowable as one of the key parameters of the digital image requires a different kind of photographic theory, one that

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http://eitherand.org/usere-use/photography-between-difference-and-representation-/ (accessed August 17, 2013)

[15] See for instance Georges Perec, *The Art and Craft of Approaching Your Head of Department to Submit a Request for a Raise*. Translated by David Bellos. London: Random House, 2011.

[16] "undecidability is always a determinate oscillation between possibilities (for example, of meaning, but also of acts). These possibilities are themselves highly determined in strictly defined situations ... they are pragmatically determined. [...] I say 'undecidability' rather than 'indeterminacy' because I am interested more in relations of force, in differences of force, in everything that allows, precisely, determinations in given situation to be stabilized through a decision of writing (in the broad sense I give to this word, which also includes political action and experience in general)." Jacques Derrida, (1988) *Limited Inc*, Trans. J. Mehlman and S. Webber. Evanston, IL: Northwestern University Press, 148.

[17] Stengers, Isabelle. *Cosmopolitics I*. Translated by Robert Bononno. 3 vols. Minneapolis, London: University of Minnesota Press. P.29

places far less emphasis on the content of the image, but is sensitive to the conditions of embodiment pertinent to the networked image: its inherent incompleteness, mutability and the constant proliferation of self-replicating fragments. What is required, in short, is not the kind of theory that interprets the visible, but a theory that is capable of addressing the extent to which the visible itself is unknowable, making traditional photographic theory – with its attachment to regimes of visuality and representation – all but unsuitable to the task. As the visual manifestation of this unknowable, the digital image stands against the whole of the philosophical tradition of subjectivity as inaugurated by Descartes, in which the subject comprehends the world through representing it to itself as an image.[18] Might we therefore be better served by drawing on another thought, one that rejects the Cartesian and dialectical heritage, one that introduced into our philosophy the mistrust of representation – by laying bare its historical foundations – and one that demands paying close attention to that which falls outside of visibility, certainty and positive knowledge. It is perhaps not surprising that until recently the anti-representational turn in philosophy had little impact on photographic theory, but perhaps now we are in a position to better appreciate its purchase on the image. The key landmarks of this thought can be found in Benjamin's *The Arcades Project*, in Nietzsche's rejection of coherent and stable individual identity and of his suspicion of scientific analysis that appeals to the higher powers of reason and morality and in Heidegger's essays *The Question Concerning Technology* and *The Age of the World Picture* in which he exposes the origins of representation in Western metaphysics. Subsequent developments of this trajectory might also include the work of Jean-François Lyotard, Gilles Deleuze and Deleuze and Guattari. Despite the significant differences in political motivations and philosophical commitments, all the above thinkers are concerned with the long term damage caused by attachment to regimes of representation and subjectivity. Within this tradition the confrontation with representational thought is considered essential as means of

[18] See for instance: Dalia Judovitz, *Subjectivity and Representation in Descartes*. Cambridge UK: Cambridge University Press, 1988 and Claire Colebrook, *Ethics and Representation: From Kant to Post-structuralism*. Edinburgh: Edinburgh University Press, 1999. This point is further developed in detail in: Daniel Rubinstein, and Katrina Sluis, "The Digital Image in Photographic Culture; Algorithmic Photography and the Crisis of Representation." In The Photographic Image in Digital Culture. 2nd Edition ed. Ed. Martin Lister (London: Routledge, September 1, 2013), 22-40.

recovering those aspects of experience that are lost when the logic of identity and rationality rules the day.[19]

For Heidegger, for instance, modern technology is nothing technological, it is not a tool in the service of progress; rather, it is the way by which subjectivity is constituted through the process of creation:

> Technology is therefore no mere means. Technology is a way of revealing. If we give heed to this, then another whole realm for the essence of technology will open itself to us. It is the realm of revealing, i.e. of truth."[20]

How might we explore this difficult Heideggerian thought in relation to the digital image? We have already seen that metadata renders the image as a calculable surface, or, to invoke Heidegger again, as a "standing reserve" in which the photograph is valued not as a singular object but as a resource to be deployed in endless and variegated successive contexts: "Everywhere everything is ordered to stand by, to be immediately on hand, indeed to stand there just so that it may be on call for further ordering"[21]. Heidegger's insight could be interpreted to suggest that the visible aspect of the digital image on the computer screen conceals the immense and unimaginable forces that operate behind the surface of the screen:

> The gigantic is rather that through which the quantitative becomes a special quality and thus a remarkable kind of greatness. Each historical age is not only great in a distinctive way in contrast to others; it also has, in each instance, its own concept of greatness. But as soon as the gigantic in planning and calculating and adjusting and making secure shifts over out of the quantitative and becomes a special quality, then what is gigantic, and what can seemingly always be calculated

[19] The logic of identity finds its fullest expression in Hegel's dictum: "What is rational is real". Georg Wilhelm Friedrich Hegel, *Philosophy of Right.* trans. S W Dyde (Mineloa, N.Y.: Dover Publications, 2005), xix. In *The Thing* Heidegger raises the question of nothing (non-being) in order to extract it from the dialectical formula set up by Hegel: 'Death is the shrine of nothing, namely of that which in all respects is never some mere being, but nonetheless essences, namely as being itself. Death, as the shrine of nothing, harbours in itself what essences of being. As the shrine of the nothing, death is the refuge of being.' Martin Heidegger, *Bremen and Freiburg Lectures: Insight Into That Which Is and Basic Principles of Thinking.* Trans. Andrew J Mitchell (Bloomington: Indiana University Press, 2012), 17. In treating being and nothing not as dialectically opposed entities but as the 'belonging together' of being and nothing Heidegger overcomes Hegel's key dictum that 'what is rational is real' and opens a path for considering the limitations imposed by dialectical reasoning.

[20] Martin Heidegger, The Question Concerning Technology, and Other Essays . Trans. William Lovitt (New York : Harper and Row, 1977), 135

[21] Ibid. 17

> completely, becomes, precisely through this, incalculable. *This becoming incalculable remains the invisible shadow that is cast around all things everywhere when man has been transformed into subjectum and the world into picture*.[22]

As a consequence of this paradigm shift from the visual to the incalculable, photography has become something immense, even unimaginable, which calls for a very different approach to the image. It is no surprise then that there is a tendency to refer to the post-industrial technical apparatus which supports image production in terms of amorphous and immaterial 'clouds' of information and 'data shadows'. However, what the bucolic idioms of clouds, shadows, streams, farms and flows are supressing is the profound unknowability of the picture. In the context of the digital image, Heidegger's insight suggests that the visible aspect of the digital image on the computer screen conceals the immense and unthinkable forces that operate behind the surface. The state of 'becoming incalculable' speculatively suggests that the digital and networked image is not an image at all, rather it is a two dimensional subset of a four-dimensional object that we familiarly call 'the web'.

4. The outside of the Image / the image of the outside

As we have seen, In *The Age of the World Picture* Heidegger characterised the modern age as the overwhelming arrival of the gigantic and the incalculable and suggested that when things become enormous in size and immeasurable in scale they also become non-representable. As the digital image traverses the network it unfolds within two perimeters that constitute its envelope: the internal kernel of its specific origins and the conditions of creation and the external boundary that is limited only by the limits of the network.[23] Amid the gradual expansion of the network beyond the limits of the computer, it is increasingly difficult to say where augmented reality ends and 'real' life begins. Practices such as wearable computing, life-caching and life-logging continually push this envelope by expanding the external boundary of the digital image, bringing forth new opportunities for classification, new assemblages, new aggregations. The three-point perspectival space of the visible image is augmented by various additional spaces that cannot be accounted for either aesthetically or

[22] Heidegger, *The Question Concerning Technology,* 12.

[23] Or as Deleuze puts it: "The crystal-image has these two aspects: internal limit of all the relative circuits, but also outer-most, variable envelope, at the edges of the world, beyond even moments of the world." Gilles Deleuze, *Cinema 2: The Time-Image.* trans. Hugh Tomlinson and Robert Galeta (London: Athlone Press, 1989), 80-81.

representationally but must be considered phenomenologically as the embodiment of the network by the user. The digital-born image is never still, never frozen, it moves between spaces and it compels the user to move with it: navigating through Google Street View for instance requires body movements that parallel the movements of the photographer though the physical space of the street.[24] Within such platforms there is no static viewpoint, no distinct separation between spectatorship and authorship, but an array of temporary constellations of images which are activated by users. The presentation of images from the underlying database is dependent on the sensitivity of the software not only to the search query, associated metadata and specific parameters coded into the interface but also to the physical movements executed by the user.[25]

This destabilisation of photographic meaning is the direct result of the image being detached from its teleological origins. Traditional ontologies of photography maintain an identity between the moment of exposure and all subsequent images, copies and prints that follow from it. This identity is ensured because the object is being sublated by the action of light and transformed by the photographic process that negates the object and preserves it at the same time.[26] One of the characteristics of the digital age is that all images are theoretically linked through communication networks which distribute, process, assemble and re-assemble electronic signals that might or might not appear as an image at some point of a cycle of packaging and re-processing of data.[27] Therefore, considered from the perspective of the network, metadata allows us to conceive of the reconfigured relationship between humans

[24] Sarah Pink. "Sensory Digital Photography: Re-thinking moving and the Image." *Visual Studies* 26, no. 1 (2011): 4-13.

[25] By way of example, the simple process of logging into Flickr or Facebook will trigger the retrieval of multiple data streams (photofeeds, status updates contingent to a user, time or tag) which is glued together on the fly to form a webpage.

[26] The notion of the photographic image as being separate from the object it depicts and yet also connected to it (through resemblance) is rooted in the philosophy of Hegel, in which the immediacy of the 'now' is always already out of reach because it is sublated into its own past and its own future. For Hegel true knowledge is only possible through the act of sublation in which an entity (being) has to pass through its own opposite (non-being) in order to emerge out of this mediation as fully realized. On Hegel and photography see Ignaz Cassar. "The Image Of, or In, Sublation." *Philosophy of Photography* 1, no. 2 (2010): 201-215

[27] "The recent rise to prominence of technologies of digitalization has offered possibilities of understanding the image beyond this premise of ocularcentrism, for digital images emphasize the extent to which the indexicality of photographic or cinematic images–the sense of an ontological link between representation and the "real" objects or actions that it represents–can be produced through manipulation of algorithms." Jacques Khalip, and Robert Mitchell, "Introduction." In *Releasing the Image: From Literature to New Media*. (Stanford, California: Stanford University Press, 2011), 2

and images. A networked image is both instantaneous in the sense that it can move across the Internet close to the speed of light and multiple in the sense that it can bifurcate into any number of simultaneous copies. In this networked environment repetition, self-replication, immediacy and divergent parallel narratives take precedence over signification and representation. These notions of instantaneity and simultaneity introduce into our thinking the experience of stepping outside of biological and historical time and inhabiting a different temporal and spatial dimension in which the image is not a marker of a linear chronology but of something that is much harder to define and yet this something appears apt to describe the fundamental experience of a life lived both inside the three dimensional physical space and outside of it, both inside the computer screen and outside of it. Seen from the perspective of metadata, the digital image emerges as the go-between that weaves together these two worlds; the physical world of three-dimensional objects and the augmented world of data.[28]

Whilst it is of course true that metadata can be faithful to the content of the image (insofar as description can ever be faithful), it is equally true that it does not need to be. In any case, metadata opens the image to the noise, the stutter and the stammer of online communication. While the screen image bears some visual resemblance to a projection of a three dimensional space onto a two dimensional plane, and for that reason can be said to conform to the logic of the Cartesian perspectival space, metadata seems to suggest a different logic that is less hierarchical, more decentred and more open-ended. The certainty of representation is augmented by the possibility of continuous re-interpretation in which it is much less important what is being represented in the image because what counts is the degrees of detachment of the image from any supposedly pre-existing reality. Metadata can contain misspellings, inarticulate muttering, factual errors and it can be simply nonsensical. Nevertheless, it creates something other than an imperfect and mutable image-library. Metadata is not so much an archive of the web but the archive of the difference that allows the parallel existence of the augmented and the real. For this reason, it is remarkable that the focus on the visible aspect of the image tends to ignore precisely those qualities of the image that are immanent to the network. As the following image (Fig. 1) assembled from a Google Image Search demonstrates, Hippolyte Bayard's *Self-Portrait as a Drowned Man* has a different sense in each one of its iterations.

[28] Daniel Rubinstein, and Katrina Sluis, "The Digital Image in Photographic Culture; Algorithmic Photography and the Crisis of Representation." In *The Photographic Image in Digital Culture*. 2nd Edition ed. Ed. Martin Lister (London: Routledge, September 1, 2013), 22-40.

fig 1.

In the above image, the search algorithm creates a heterotopia of images connected not through a hierarchy of master–reproduction or of degrees of resemblance but through a non-hegemonic patterning and correlation of metadata and contextual text ("Bayard", "self-portrait", "drowned") which creates differences of intensities.[29] The dialectic of original–copy becomes subordinate to a differential logic of infinite bifurcation; it is no longer meaningful to ask whether one image instance is a better reproduction, because the question of resemblance is rendered undecidable by the search algorithm that is able to respond to the query with almost indefinite number of results. Instead, what matters is that every version is a springboard towards yet another instance, triggering an infinite succession of image-instances that are all suspended in their own irreducible difference from each other. Here photography is not so much a vehicle of representation but an expression of the possibility of variation and

[29] Heterotopia is a term coined by Foucault to describe non hierarchical, non hegemonic spaces. See: Michel Foucault, *The Essential Works of Michel Foucault, 1954-1984. Vol. 2, Aesthetics*. Ed. Paul Rabinow trans. Robert Hurley and others (London: Penguin, 2000) 175-185.

difference that happens through repetition.[30] It is significant that in the above image the difference between each version is not 'analytically decomposable' (Lingis), i.e. it can not be explained by means of a semiotic analysis because these images do not have a 'fixed' reference point, as within each possible context their meaning can be fundamentally altered.[31]

Rather than considering this image as thirty five imperfect copies of instances of corruption and degradation of the original, the logic of the network allows us to speculate that this is an image of difference itself, glimpsed through the repetition of disparate image fragments. Difference her appears not as something visible, but as the invisible that is closest to the visible, nurtured and sustained by it.[32] It is as if these images are framed not by their own borders – which are purely symbolic anyway – rather they are enclosed by the differential between them. By evacuating the essentialism of original-copy from this (photographic) archive and restoring to it a play of distinctions between degrees of intensity, it becomes possible to rethink photography away from the logic of representation. This archive of Bayard bursts open the teleological connection between the object and its referent, establishing photography not as the vehicle of identity but as the main mechanism by which difference appears within the visual field.

The difference that arose out of the impurities and distortions of data in this example is the result of an interaction between images that does not depend on any underlying representation or 'ground' in the form of an original, primordial image. It is pointless to ask which of these is a true likeness of Bayard's masterpiece, as this image foregrounds not a new form of representation but a kind of texture comprised of noises, differences, distortions and

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[30] The notion of difference is a staple of post-metaphysical thought. For Heidegger difference is that which lies so near to us that we never notice it, and yet it is difference that allows for identity (and for representation) to happen. His conception of difference is most clearly articulated in the lecture *The Onto-Theo-logical constitution of Metaphysics*. See also Deleuze's monumental critique of representation in *Difference and Repetition*. For an overview of the problem of difference see: Widder, Nathan. *Genealogies of Difference*. Urbana: University of Illinois Press, 2002

[31] Deleuze clarifies this point succinctly: "The diversity of narrations cannot be explained by the avatars of the signifier, by the states of a linguistic structure which is assumed to underlie images in general." Gilles Deleuze, *Cinema 2: The Time-Image.* Trans. Hugh Tomlinson and Robert Galeta (London: Athlone Press, 1989), 137.

[32] This understanding of difference as the pre-condition of identity is drawing on Deleuze: "Difference is not diversity. Diversity is given, but difference is that by which the given is given, that by which the given is given as diverse. Difference is not phenomenon but the noumenon closest to the phenomenon". Gilles Deleuze, *Difference and Repetition.* Trans. Paul Patton (London: Continuum, 2004), 280.

contaminations[33]. What is being archived here is not a copy of an original but the possibility of bifurcation between copies. In short, we are presented with a sensual kind of logic that compels the viewer not to evaluate resemblances but to glimpse the production of difference through repetition and self-replication. This multiplicity of repetitions suggests not a hierarchy of representations – with some closer to the original than the others – rather, it suggests that there are only repetitions without ground and without foundation. As the product of algorithmic computation photography is considered here as a process of differentiation which creates a visible yet ungraspable image of ourselves as we step out of the representational paradigm.[34]

5. Conclusion

As photography becomes an encoded, networked object, the emphasis shifts from considering it in visual terms towards the semantic processes valorised within computational culture. This in turn establishes photography as a kind of unstable surface that produces meanings not through indexicality or representation but through the aggregation and the embodiments of data. There is then a need to address the topologies that represent relations

[33] Alphonso Lingis wrote at length on the noise in the message and on the message of the noise: 'Is it not also false to suppose that only the meaning attached to words by a code, fixed or evolving, communicates? The rhythm, the tone, the periodicity, the stammerings and the silences communicate.[…] This noise is not analytically decomposable, as communication theory would have it, into a multiplicity of signals, information-bits, that are irrelevant or that conflict […]. Alphonso Lingis, "The Murmur of the World," In *American Continental Philosophy: A Reader,* ed. by Walter Brogan and James Risser (Bloomington: Indiana University Press, 2000), 105. Specifically on noise as the aesthetic determination of networked, non-Euclidian environments see Joseph Nechvatal, *Immersion Into Noise.* (Ann Arbor: Open Humanities Press, 2011), and Joseph Nechvatal, *Towards An Immersive Intelligence: Essays on the Work of Art in the Age of Computer Technology and Virtual Reality 1993-2006.* (New York: Edgewise Press, 2009).

[34] For Foucault this kind of archive is never closed, never completed, never achieving the totalizing and universal state of 'truth', and yet it is productive of a form of existence that reclaims difference from representation, a surface out of depth and singularity out of homogeneity: "[I]t dissipates that temporal identity in which we are pleased to look at ourselves when we wish to exorcise the discontinuities of history: it breaks the thread of transcendental teleologies; and where anthropological thought once questioned man's being or subjectivity, it now bursts open the other, and the outside." Michel Foucault, *The Archaeology of Knowledge.* Trans. A.M. Sheridan Smith (London; New York: Routledge, 1989), 131.

amongst data, and the way in which the movement of images, their clustering and accretions reorganize themselves around the movement of the user as they traverse the interface.

This paper proposed that the image within the network is doing something other than showing us pictures, and it is doubtful if the vocabulary of visual aesthetics and representation is fit to tackle this new condition of the image. Because the system of representation that has been historically indispensable for photography is increasingly inadequate in apprehending the networked image, a new set of conceptual tools is necessary. What is required is a different ontology of the image, not one of transcendental truth, dialectics, light, vision and identity, but an immanent ontology that can engage with the undecidable, fragmented, recursive and multiple image produced and sustained by the World Wide Web. Metadata releases the image from its stillness, giving it a new meaning as the shape of continuous re-invention, underpinned by endless succession of users-who-become-authors. Brought to life by metadata and made visible as a software output, it is not identity that the networked image delivers to the screen, but rather an image of multiplicity and difference engendered by the network.

Acknowledgement

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Biography

Daniel Rubinstein is the Head of MA Photography at Central Saint Martins, University of the Arts London. Dr Rubinstein's work examines the photographic image in the context of contemporary philosophy, networked and mediated urban environments, modern science and digital platforms within visual culture. Currently he is the editor of the journal *Philosophy of Photography* and the Lead Investigator on Arts and Humanities Research Council (AHRC) Photography Research Network.

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