Notes on the Margins of Metadata;
concerning the undecidability of the digital image.

Daniel Rubinstein and Katrina Sluis

Abstract
In this paper we consider the significance of metadata in relation to image economy of the web. Social practices such as keywording, tagging, rating and viewing increasingly influence the modes of navigation and hence the utility of images in online environments. To a user faced with an avalanche of images, metadata promises to make photographs machine readable in order to mobilize new knowledge, in a continuation of the archival paradigm. At the same time, metadata enables new topologies of the image, new temporalities and multiplicities which present a challenge to historical models of representation. As photography becomes an encoded discourse, we suggest that the turning away from the visual towards the mathematical and the algorithmic establishes undecidability as a key property of the networked image.

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. (Heidegger, "What is Called Thinking?" 22)

Clarification
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 indicate provenance (authorship, ownership, conditions of use). With respect to photographs, metadata comes in two categories: descriptive metadata which is generated mechanically during image creation or added later to the file (containing details such 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. By enabling the exchange and structuring of information, metadata is crucial in shaping information economies and informs the efficient operation of search engines. Facebook's Open Graph, Google's Knowledge Graph, Schema.org, microformats.org are examples of emergent competing protocols which describe the application of metadata to semantic elements on the web to help machines map relationships between entities. Metadata's production underpins the future Semantic Web, a utopian vision of a machine-readable web in which the automatic processing of information by non-human actors becomes possible[1]. Whilst one common definition of metadata is 'data about data', in this paper we suggest that this characterization is unhelpful because it does not clarify metadata's place as a mediator between humans and computers.

Advances in pattern recognition algorithms notwithstanding, it is still the case that the computer cannot accurately recognise what the photograph contains. By re-writing the image as machine-readable text, metadata facilitates the identification, discovery, retrieval, mis-use,

exploitation and dissemination of images online. Metadata is highly political: it offers a means for asserting ownership and use of otherwise contextless images; it specifies topologies between images; its development and use promises to democratize access to disparate digitized image collections and to facilitate the flow of images across the network in multiple directions at once. Metadata practices such as tagging and annotation allows users with no programming skills to have some control over the visibility and aggregation of images and influence output of algorithms deployed to sort, sift and supply images for the web interface. For this reason metadata opens the image to a wide range of influences which depend not on the content of the image but on the decisions (wise or unwise) made by users. To conceive of metadata simply as another layer of information is therefore to overlook its potential to contaminate, mutate or change the direction and context of the image at every turn. As Matteo Pasquinelli explains, 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, process and valorize (21-24). As we will discuss in this paper, on the network, the semantic capital of an image is determined by a range of signals which supplant previous - visual - economies of the image.

The Undecidable Image

There is little about metadata that can resolve the ordering uncertainties of the exasperated online archivist. Metadata brings forward the inherent instability of meaning of the networked image as at each moment, and in each new instance, the tags and annotations that inform metadata can be modified, altered, deleted and changed. Google provides access to EXIF metadata through its Image Search with the proviso “EXIF data may not always be accurate” (‘Google Image Search: Click a Result’). 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 ratings of the image in search queries but also can radically modify what the computer ‘sees’ in the image (Rubinstein and Sluis 2013). Small changes to metadata can completely redefine the context and circulation of an image: consider for example practices such as Facebook “likebombing” or tag spamming in order to influence circulation of online content. Flickr forums have become a popular space for amateur photographers to exchange tips for how best to ‘game’ the Flickr algorithm through the manipulation of tags, groupings and comments in order to achieve higher ratings and visibility. In commercial applications, image search engine optimization is becoming crucial for those photographers seeking to understand the relationship between network traffic and value. Where once the key to online photographic portfolio design included a consideration of the aesthetics and visual language of the website interface, today it is very much skewed towards the design of websites which have prioritised the optimization of link titles, document titles, copywriting, site structure and metadata for a non-human audience. In relation to the image economy of the web this is an illustration of the way the algorithmic and computational aspects of the image takes precedence over the visual.

Metadata therefore renders the image as a calculable surface, or, to invoke Heidegger, a “standing reserve” in which the photograph is valued not as a singular object but as a resource to be deployed in endless and varied 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" (298). The Stock Artists' Alliance 2006 'Metadata Manifesto' asks readers to "[i]magine a world where metadata is ubiquitous" in which "images can be easily located and identified by anyone, anywhere", and in view of the fragility of metadata one of their main demands is that "[o]wnership metadata must never be removed" and must be respected by search engines and preserved on social media platforms ('Metadata Manifesto').

But whilst the accumulation and exploitation of metadata promises to finally deliver a machine-readable representation of the world, it paradoxically makes it unknown to us. In "The Age of the World Picture" Heidegger (135) talks about the modern age as the overwhelming arrival of the gigantic and the incalculable, and suggests that when things become enormous in scale and immeasurable they also become non-representable and a change takes place that makes old cognitive categories redundant.

> 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 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.(Heidegger 135)

As a consequence of this paradigm shift, 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 postindustrial technical apparatus which supports image production in terms of amorphous and immaterial 'clouds' of information and 'data shadow'. However, the cyberspeak of clouds, shadows, streams, farms and flows is misleading and unhelpful as it uses these bucolic metaphors to conceal the profound unknowability of big data.

Under the auspice of metadata the networked image becomes progressively oriented towards being 'read' not by humans but by computers which raises significant questions about the political agency of the image. To state the problem quite directly: talking about the digital image as immaterial or as mathematically determined posits complete identity between the content of the image and its form. The image then becomes the perfect expression of the rational, mathematical and logical operation which produced it. As both Adorno (4-6) and Lyotard (42-94) are at pains to point out: when the concept is identified with the object to such an extent that no space for ambiguity, negation and otherness remains, the image risks losing all potential for political agency which depends on the possibility of a multitude of interpretations, ambiguities and differences (Drucker 141-145). When materiality is evacuated from the image it becomes hostage to positivist interpretations that maintain complete identity between the image and its referent. In parallel, one might observe that there is a widespread insistence on calling the web rational, citing its origin in military industrial complex and positing Shannon and Weaver's *Theory of Communication* (1949) as its driving principle. However, in the light of Heidegger's statements above, it would be more

productive to think of the network as an irrational extension of a society that insists on calling itself rational.

The Incomplete and Processual Image

As the digital image traverses the network it brings forth new opportunities for classification, new assemblages, new aggregations. The digital-born image is never singular, it appears in series, repetitions, sequences, rapid volleys (Lister et al. 105-158). Each retweet, reblog, rating or tag generates further metadata which can amplify the intensity of the image, its reproducibility, and create topologies between images[2]. With respect to Flickr, the simple act of tagging an image 'cat' immediately connects the image (whether it depicts a cat, dog or fish) with 100,000 other photos of images deemed to have a relationship to the term 'cat', which can be brought to the screen with a casual click (Rubinstein and Sluis 2008). 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 image to the search query, associated metadata and specific parameters coded into the interface[3].

Considered from the perspective of the network, metadata allows us to conceive of the reconfigured relationship between photographer-model-audience. 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 copies. In this climate repetition, seriality and divergent parallel narratives take precedence over signification and representation. 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 (Osborne 61-70).

While 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 doesn't need to be. In any case, metadata opens the image to the noise 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 space, metadata clearly belongs to a very different kind of logic. Metadata can be noisy, contaminated, irregular. It can contain misspellings, inarticulate muttering, static noise and a little bit of chaos (Lingis 95-113). For that 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 assembled from a Google Image Search demonstrates, Bayard's *Self-Portrait as a Drowned Man* has a different sense in each one of its iterations.

fig 1.

In the above image the search algorithm presents a topology of images connected through a certain patterning or correlation of metadata and contextual text (“bayard”, “self-portrait”, “drowned”). Here photography is not so much a vehicle of representation but an expression of the possibility of variation and difference that happens through repetition. It is significant that in the above image, the difference between each one is not “analytically decomposable”, it is not representable in any other way than as the tension, or the noise between the images (Lingis 108).[4] Rather then considering this image as 40 multiple imperfect copies of a master-original, the logic of the network suggests that this is an image of difference itself glimpsed through the repetition of disparate image fragments. The difference that arose out of repetition in this example is the result of an interaction between images that does not depend on any underlying representation or ‘ground’. Yet it is not nothing, it is not meaningless but it suggests a kind of vision that is divergent from the ocularcentric Cartesian perspective and from the point of view of the static observer. This multiplicity of repetitions suggests not a hierarchy of representations – with some closer to the original then the others – rather, it suggests that there are only repetitions without ground and without foundation. As the product of mechanical reproduction, photography is considered here as a process of differentiation which creates a visible image of the differences between images.

Conclusion

As photography becomes an encoded, networked object, the emphasis shifts from considering it in visual terms towards the semantic processes valorized 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

topologies of data. There is then a need to address the topologies that represent relations amongst data, and the way in which the movement of images, their clusterings and accretions reorganize themselves around the movement of the user as they traverse the interface.

In this paper we proposed that the image within the network is doing something other than showing us pictures, and it is doubtful if we have the right vocabulary to address this new image. Because the system of representation that has historically been 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 metaphysics of the image, not one of system, dialectics, light, vision and truth but a metaphysics that can engage with the indeterminate, 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 the multiplicity engendered by the network.

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[1] 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."

[2] The dynamics of tagging in Flickr Groups is taken up by Dr LopLop in 'Somebody else's cat: A study in the protohistory of the internet cat meme'.

[3] 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.

[4] 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 […] (Lingis 105)

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Biographies

Daniel Rubinstein is a critical theorist, writer and photographic artist who is a Senior Lecturer in the Department of Arts and Media, London South Bank University. His research covers the trans-disciplinary fields of contemporary philosophy, Media Art, and communication technology. Underpinned by multifaceted engagement with photography, his work examines the digital image within the context of networked and mediated urban environments. He is the editor of the international journal Philosophy of Photography published by Intellect.

Address: Department of Arts and Media, Faculty of Human Sciences, London South Bank University, Borough Road, London SE1 0AA, UK. [email: rubinsd@lsbu.ac.uk]

Katrina Sluis is a New Zealand born artist, writer, curator and educator. She combines her present role as Curator (Digital Programme) at The Photographers' Gallery with her post as Senior Lecturer at London South Bank University. Her present research concerns questions of materiality, archiving and transmission in relation to the networked photograph both inside and outside the museum. Address: Department of Arts and Media,
Faculty of Human Sciences, London South Bank University, Borough Road, London SE1 0AA, UK. [email: sluiskp@lsbu.ac.uk]