ADVANCEMENTS IN DESIGN RESEARCH

11 PhD theses on Design as we do in POLIMI

edited by Lucia Rampino and Ilaria Mariani

D.I. DESIGN INTERNATIONAL
FRANCOANGELI
OPEN ACCESS

Over the last few years the international design research network has become an important reality, which has facilitated the sharing of ideas and opinions, improved understanding of the subject and increased awareness of the potential of design in various socio-geographical contexts.
The current expansion of the educational network allows teachers, students, researchers and professionals to meet, both online and in person.
It would seem therefore that the time is now right to propose a new series of books on design, contributing the construction of the international design community, helping authors bring their work onto the world scene.
The Design International series is thus born as a cultural setting for the sharing of ideas and experiences from the different fields of design, a place in which you can discover the wealth and variety of design research, where different hypotheses and different answers present themselves, in an attempt to draw up a map of Italian design, though in a continuous comparison with the world scene.
Different areas of design will be investigated, such as for example: fashion, interior design, graphic design, communication design, product and industrial design, service and social innovation design, interaction design and emotional design.

Books published in this series are selected by the Scientific Board and submitted to two referees for peer-review.

 ISBN 9788891786197

Copyright © 2019 by FrancoAngeli s.r.l., Milano, Italy. ISBN 9788891786197

ADVANCEMENTS IN DESIGN RESEARCH

11 PhD theses on Design as we do in POLIMI

edited by Lucia Rampino and Ilaria Mariani

D.I. FrancoAngeli DESIGN INTERNATIONAL OPEN ACCESS

 ISBN 9788891786197

Cover by: Ilaria Mariani

Copyright © 2019 by FrancoAngeli s.r.l., Milano, Italy. ISBN 9788891786197

Contents

Collaborative Processes Enabled by Design

Design for Cultural and Creative Companies

Design and Technology for Social Change

Studying digital images in groups: the folder of images

Gabriele Colombo
Department of Design, Politecnico di Milano
Department of Architecture and Arts, Università Iuav di Venezia

Abstract

Digital images, available online at an unprecedented scale, represent a valuable data source for the study of cultural phenomena. The digital nature of web images requires us to reconsider the approach to their study. I discuss four features of digital images, to make the case for the shift from the individual image to a group of images (i.e. the folder of images) as a main unit of analysis. The four features are: volume, images as data, networked nature, blurriness. As a proposal for an updated approach to visual research, I put forward the design of tailored interfaces for the study of images *in groups*.

Image research in the digital

The idea that insights into society may be acquired through the analysis of various forms of visual manifestations is common to a large number of academic disciplines. While some are specifically designed to deal with the visual (e.g. iconography and iconology), others are amended for the inclusion of images in their traditional practice, and often obtain the *visual* attribute in the process (e.g visual sociology and visual anthropology). That images may be used for the study of society and culture is also a shared belief of various design traditions, with images profusely employed in the deluge of user-centered research methods. Referred to with terms such as, to name a few, «Image-based research» (Prosser, 1998), «Visual Methodologies» (Rose, 2016), «Visual Analysis» (Van Leeuwen and Jewitt, 2001), «Visual Research methods» (Mannay, 2015), such a widespread, yet fragmented, practice has prompted scholars to attempt describing under a unique term a

«growing disparity of visual approaches» (Pauwels, 2011). The profusion of edited volumes dedicated to «researching with visual material» (Rose, 2016) may indeed be read as the signal of a very fragmented field, or a lack thereof.

To complicate matters, the digital, in its broader sense, and more specifically the web, has profoundly changed visual culture. The renewed nature, means of production and role of images in our digital society demand a reconsideration of the methods used for their study. To think of the image found online as a new, inherently different, research object, means to productively think about the new analytical opportunities that rise from its digital nature, as well as to its challenges. Relatedly, in the call of the 11th Digital Methods Summer School (2017), dedicated to Digital Methods for Visual Research, it is asked: «does the online make a difference to the study of the visual?».

In order to make the case for the study of images *in groups*, in what follows, I discuss four features of the digital image and the implications of its use for social and cultural research: volume, images as data, networked nature and blurriness. The first refers to an unprecedented availability of visual material, and to the danger, including for visual researchers, of adhering to the «problematic underlying ethos that bigger is better, that quantity necessarily means quality» (boyd and Crawford, 2011, p. 6). The second feature introduces images as (machine-ready) data, scanned efficiently at a massive scale by proprietary «machine-to-machine seeing apparatuses» (Paglen, 2016), thus raising the question of what visual research can add in a data-intensive society. The third feature presents images online as nodes of a network (Niederer, 2018a) and calls for the inclusion of the work of users and platforms in a networked approach to visual research. The fourth point concerns a general blurriness of the digital image, that loses its uniqueness online, becomes unstable and «in motion» (Steyerl, 2009), and thus is harder to capture and study.

Lastly, I draw from the aforementioned features to call for an approach to visual research attuned to the digital nature of visual culture: an approach that considers images *in groups*, and treats them not as isolated from their (digital) context.

Volume: more images

For the project «24 Hrs In Photos», Erik Kessels (2011) fills a room «from floor to ceiling» of the Foam Gallery in Amsterdam with thousands of printouts: every image uploaded online in one day. The exhibition lets visitors experience the feeling of drowning, quite literally, in a sea of daily produced visual content. It is a recurring endeavour to measure, or estimate, the vol-

ume of images out there. Since 2014, the Kleiner Perkins Internet Trends Report returns the daily number of shared photos on selected platforms, per year. In the lack of such data in the 2017 version of the report (Meeker, 2017), one may read a signal of the pervasiveness of images on the web, that no longer need to be counted, as they have become the main currency of any online transaction. With images being the chosen means for most online tasks – documenting, searching, trolling, sharing – photography has become «ubiquitous» (Hand, 2012), closely intertwined with our networked life.

In an «image-dominated network society» (Mirzoeff, 2015, p. 13), methods for visual research based on the close engagement with images, or «attentive stance» (Rose, 2016, p. 10), might seem unsustainable, or «unlikely to be effective» (Ibid.). The unprecedented availability of visual material, raises new methodological challenges of «scope, scale and selection» (Hand, 2016). If images are everywhere, where do we look? The data selection phase becomes crucial, both conceptually and practically.

Images as data

Digital technologies brought to visual culture a quantitative change as well as a qualitative one. Besides being considerably more available than before, digital images are also inherently different from their analogue precursors: no longer are they produced with chemical processes, but rather they are the result of algorithmic work. «Soft image» (as opposed to hard image) is a term that captures the shift towards an image intrinsically merged with software (Hoelzl and Marie, 2015) in its production, fruition and circulation. The book «The Glitch Moment(um)» presents a «vernacular of file formats» (Menkman, 2011), or glitches, obtained by inserting errors in the underlying code of an image. In the artworks, the visual indicator of the error exposes the algorithmic make-up of one digital image.

The fact that images are soft also means that they are machine-readable, in that they are «in a form that a computer can process» (Machine readable, nd), or streamlined to be scanned by machines, often before they are seen by humans (Paglen, 2016). Operative images (Farocki, 2004), those «that do not represent an object, but rather are part of an operation» (p. 17), first confined to military settings (with machine vision technologies packed into unmanned missiles), or industrial production facilities (with mapping and object recognition), have recently flooded our cities to sustain a massive surveillance infrastructure. Today, most of the images online have been probably scanned by a machine and not necessarily seen by a human. If one

were to look into one of these «machine-to-machine seeing apparatuses», she would find a highly encoded flux of data, «a menagerie of abstractions that seem completely alien to human perception» (Paglen, 2016). Attempts have been made at putting humans back in the loop, theorizing ways of «seeing like a machine» (Ballvé, 2012), or designing ways to «peek inside these networks» (Mordvintsev *et al.*, 2015).

Facing an ever-growing (private-owned) seeing apparatus, scanning every bit of visual content uploaded online, one may ask: what is left for research? Do close-reading methods pale in front of the breadth of an inescapable seeing infrastructure? How can one carry out visual research in a computation-intensive society? The danger, for visual researchers too, is to approach the study of digital images armed with what James Bridle (2018) defines as «computational thinking», that is «the belief that any given problem can be solved by the application of computation» (Bridle, 2018). On the other hand, one response to the ubiquity of computational technologies in our visual culture, might specifically involve the repurposing of those same technologies for research goals.

Images as networked content

In the introduction of «The photographic image in digital culture» Martin Lister (2013) describes the move «from image to network» as the theme of the second edition of the volume. The shift could be characterized with the image studied as a web object served through an online interface, and with its (digital) materiality fading into the background. The move towards the network is also a move *outside* of the image, which begins to be studied alongside its digital context. That images are networked means they are to be considered «not as solitary objects, but as a part of a network of other images, users and platforms» (Niederer, 2018a). In the project «Reblogs or Context is the New Content», design researcher Silvio Lorusso (2015), visualizes «the trail created by a single digital image while traveling through a social platform». The project is a video montage of the same image, reblogged – to use the term of the platform – by Tumblr users on their personal page. To address the entanglement of visual, textual and numerical elements at play in a page online, the notion of «photographic document» (Neal, 2010) considers the image as only one part of a larger ecosystem of digital objects on offer for research.

There is in fact a diverse set of data that one can extract, or retrieve, from one single online image. A distinction may be made between the «mechanically captured metadata» and that generated from network activity such as tags, engagement metrics or timestamps (Rubinstein and Sluis, 2008). A fur-

ther classification differentiates external data (such as location coordinates and timestamps) from internal ones, extracted with digital image analysis techniques (Hochman, 2014). Another way of making a distinction is one based on data storage, with technical information (such as exposure, camera model and shot location) stored within the image file, whereas tags, captions and metrics are stored independently (Rubinstein and Sluis, 2013). Metadata, engagement metrics, tags and the likes render «the image as a calculable surface» (Ibid.), that can be measured, retrieved, or scraped.

Networked images are embedded into the platforms and websites that host them, and those platforms «have a particular way of formatting, prioritising, and recommending content» (Niederer 2018a). Indeed platforms' features stimulate particular communicative patterns, or platform vernaculars (Gibbs *et al.*, 2015), which result in the production of platform-specific content, such as «rants on blogs, tweet storms on Twitter» or «long-forms on Medium» (Rogers, 2017, p. 1). There have been empirical attempts at identifying platform-specific image formats, that are the types of images exclusively, or mostly, shared on a particular platform. To do so, classification of (preferably random) sampled content is used to distill the most-shared image types *in general* on one platform such as Twitter (Thelwall *et al.*, 2016) or Instagram (Hu *et al.*, 2014). Other approaches involve the study of one issue across multiple platforms. For example, one could study which images are used to represent "climate change" in different platforms: how does Twitter "do" climate change? How does Instagram? Do they offer an identical visual representation of the topic? Here «platform visual vernaculars» (Pearce *et al.*, 2018; Niederer, 2018a) are distilled by comparing the most-engaged-with images across platforms. One other proposal for a platform-sensible approach to visual research may involve the study of one single platform, its user affordances and their effects on the type of content produced, as proposed in one «Instagrammatics» agenda (Highfield and Leaver, 2016). The issue at stake is the recognition of a platform's technical features as actively shaping the content published on them (Niederer, 2018b). Generally, a networked approach to image research should not treat images as separate from their carriers.

Blurriness: multiple, unstable and mobile images

By definition, blurriness refers to «the quality of being indistinct and without sharp outlines» (Blurrinesss, n.d.). I define the blurriness of digital images, or loss of sharpness, with three terms: digital images may be characterized as *multiple*, *mobile* and *unstable*.

First, as a consequence of the aforementioned networked nature, digital images are ready to be linked to each other in *multiple* formations. On the web, an image rarely stands alone: hashtags, users, comments, and other metadata are there to group images with other similar images and generate multiple «imagined data communities» (Hochman, 2014). An image online is rarely served on its own, but rather «as strings, threads, sets, grids» (Lister, 2013, p. 8). Artist Penelope Umbrico provides an ongoing visual evidence of such multiplicity, enabled by metadata and other elements associated with an image online. Since 2006, she has presented sunset shots collected from Flick in an ever-growing grid of almost identical suns. The title of the project is updated constantly with the numbers of results one gets from searching the word [sunset] on the platform. As of 2016, the title reads: 30,240,577 Suns (from Sunsets) from Flickr. The wall of multiple instances of the same object is a curated example of the infinite collections of similar images one could find online.

A second declination of blurriness refers to the *mobility* of digital images, in that they are seen on multiple sites and modified by users and platforms. One definition is the «poor image», that is a «copy in motion» (Steyerl, 2009) and loses its quality when downloaded, modified, reblogged, or turned into material for a meme. One could say that image-making has paved the way for image-moving as the main practice sustaining visual culture online. It is the advent of «circulationism», which is «not about the art of making an image, but of post-producing, launching, and accelerating it» (Steyerl, 2013). Another term is «ephemeral» (Hand, 2016), that captures the fleeting nature of digital visual content, often specifically produced to disappear after a period of time.

Thirdly, the meaning of digital images is unclear, or *unstable*, in that it repeatedly changes as images travel around. There is a continuous process of redefinition and reassessment of the meaning of the digital image: when images are tagged, liked or commented, meaning is continuously negotiated, making it the result of a shared and collective activity.

In relation to this instability, analyzing individual images might fail to address «important dynamics of visual social media, especially regarding fluid inter-textual meanings» (Hand, 2016, p. 220). If most of the images we encounter online are to be found in groups, is the study of individual images still a valuable approach? Furthermore, should casual and volatile ways of looking be matched with equally casual and volatile research methods (Lister, 2013)? What kind of visual analysis is needed to unpack a multiple, unstable and mobile image?

Towards the folder of images: studying images in groups.

The specific features of digital images require for an amended approach to their study. To describe digital images as mutable arrangements of content, available at an unprecedented scale and embedded in a larger ecosystem of users and platforms, entails to reconsider the methods that have been used up until now to study single, stable, scarce and enclosed images. Specifically, we need strategies that shift the focus from the individual image to the *group of images* as the unit of analysis.

In a research setting for the study of images in groups, one begins inevitably with a folder of images. The scenario of use, to use a term from design research, is that of a folder full of images and their metadata which is open to interpretation. The folder of images is a metaphor to note the analytical shift towards the collection of images, but it also represents a very practical situation. After research questions are formulated, a list of sources compiled and content is located and collected, the research path ends with a collection of images saved in a local or shared folder. At this point, the need to look into the collection arises. How does one observe a group of images in a structured way? The folder, built-in to most operating systems, represents the most common interface for a set of images in a research setting, despite its limited display options, often limited to a grid or list of items. Research photo management softwares[1] usually offer enhanced functions (such as advanced search or easier image annotation), but do not provide new custom display options.

The study of digital images *in groups* should be supported by the design of *ad hoc* visual interfaces. As scholar Johanna Drucker (2010) has argued, visual models are far from being innocent, but rather embed specific ways of thinking. Relatedly, the design of tailored display solutions for a set of images may promote particular «ways of seeing» (Berger, 1972), while rendering difficult other lines of enquiry. For this reason, the ways in which a folder of images is displayed should not be limited to the options offered by available softwares, but rather carefully designed based on researchers' needs.

One proposition for the study of a folder of images is what I have termed «the design of composite images» (Colombo, 2018): a composite image is the result of the combination of multiple images into a new synthetic artifact,

[1] For example, the «Research Photo Management software» Tropy (Roy Rosenzweig Center for History and New Media, 2015), developed at the George Mason University, makes the management of research visual material easier, from annotation to advanced searching, yet it only allows users explore a collection of images in a regular grid (https://tropy.org).

that supports researchers' interpretative work. For example, a grid of images ordered by time of upload may be repurposed as a narrative format (Colombo and Azzi, 2016); layering dimmed images into one composite helps to summarize visual features (Pearce *et al.*, 2018; Niederer, 2018); or the organization of a set of images images based on content similarity may be used to stimulate the detection of thematic clusters (fig. 1).

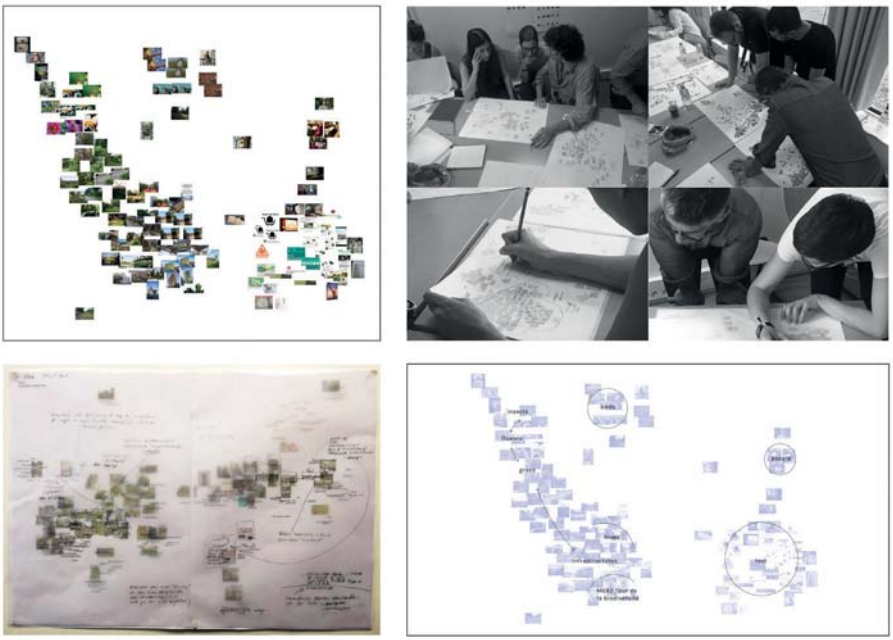

Fig. 1 – In a research project concerned with the online mapping of the issue of urban nature (Ricci et al., 2018), researchers, designers, and experts collectively interpret a composite image. Images from Twitter are grouped in the page based on similarity (top left), thus encouraging the detection of thematic clusters (top right). Researchers annotate their analysis on a second layer (bottom left), that is then summarized in a diagrammatic form (bottom right).

Conclusions

In this text, I have argued for an approach to visual research attuned to the networked nature of digital images. Specifically I have made the case for the analysis of collections of images as opposed to individual ones. I have then argued in favor of the design of *ad hoc* interfaces for the analysis of

such collections. The rationale for this proposal is the acknowledgment that to study a radically new kind of image, digital and networked, we also need to design a new type of image. One that is able to aggregate and recompose multiple and frameless formations collected online into stable artifacts open to inspection.

References

Ballvé, T. (2012). *The New Aesthetic Part I: Seeing Like a Machine.* Retrieved from http://territorialmasquerades.net/the-new-aesthetic-part-i-seeing-like-a-machine. Accessed on October 1, 2018.

Berger, J. (1972). *Ways of Seeing*. London: Penguin Books.

Blurriness (n.d.). In WordNet 3.0 Princeton University. Retrieved from http://wordnetweb.princeton.edu/perl/webwn?=&s=blurriness. Accessed on October 1, 2018.

boyd, D., and Crawford, K., (2011). Six Provocations for Big Data. *A Decade in Internet Time: Symposium on the Dynamics of the Internet and Society*, September 2011. DOI: 10.2139/ssrn.1926431

Bridle, J. (2018). *New dark age: Technology and the end of the future*. London, UK: Verso Books.

Colombo, G., and Azzi, M. (2016). *Fakes, flames and memes.* Retrieved from https://medium.com/densitydesign/fakes-flames-and-memes-part-1-9707961b7b10. Accessed on October 1, 2018.

Colombo, G. (2018). *The design of composite images. Displaying digital visual content for social research* (Doctoral dissertation). Milano, Italy: Politecnico di Milano. Retrieved from: http://hdl.handle.net/10589/141266. Accessed on October 1, 2018.

Digital Methods Initiative (2017). *Get the Picture. Digital Methods for Visual Research. Digital Methods Summer School 2017*. Retrieved from https://wiki.digitalmethods.net/Dmi/SummerSchool2017. Accessed on October 1, 2018.

Drucker, J. (2014). *Graphesis: Visual forms of knowledge production*. Cambridge, MA: Harvard University Press.

Farocki, H. (2004). Phantom images. *Public, 29*, 12-22.

Gibbs, M., Meese, J., Arnold, M., Nansen, B., and Carter, M. (2015). #Funeral and Instagram: Death, social media, and platform vernacular. *Information, Communication & Society, 18*(3), 255-268. DOI: 10.1080/1369118X.2014.987152

Hand, M. (2012). *Ubiquitous photography.* London, UK: Polity Press.

Hand, M. (2016). Visuality in social media: researching images, circulations and practices. In Sloan, L., and Quan-Haase, A., *The SAGE Handbook of social media research methods*, 215-231. London: SAGE Publications. DOI: 10.4135/9781473983847.n14

Highfield, T., and Leaver, T. (2016). Instagrammatics and digital methods: Studying visual social media, from selfies and GIFs to memes and emoji. *Communication Research and Practice, 2*(1), 47-62.

Hochman, N. (2014). The social media image. *Big Data & Society, 1*(2). DOI: 10.1177/2053951714546645

Hoelzl, I., and Marie, R. (2015). *Softimage: Towards a New Theory of the Digital Image*. Bristol: Intellect Books.

Hu, Y., Manikonda, L., and Kambhampati, S. (2014). What We Instagram: A First Analysis of Instagram Photo Content and User Types, in *8th International Conference on Weblogs and Social Media*, *ICWSM 2014*. Cambridge, MA: The AAAI Press.

Kessels, E. (2011). *24 Hrs in Photos*. Retrieved from www.kesselskramer.com/exhibitions/24-hrs-of-photos. Accessed on October 1, 2018.

Lister, M. (Ed.) (2013). *The Photographic Image in Digital Culture*. London: Routledge.

Lorusso, S. (2015). *Reblogs or Context is the New Content*. Retrieved from http://silviolorusso.com/work/reblogs. Accessed on October 1, 2018.

Machine readable (n.d.). In *Oxford Dictionaries*. Retrieved from https://en.oxforddictionaries.com/definition/machine-readable. Accessed on October 1, 2018.

Meeker, M. (2017). *Internet Trends Report 2017*. Retrieved from www.kpcb.com/internet-trends. Accessed on October 1, 2018.

Menkman, R. (2011). *The glitch moment (um)*. Amsterdam, Netherlands: Institute of Network Cultures.

Mirzoeff, N. (2015). *How to See the World*., London: Pelican Books.

Mordvintsev, A. *et al.* (2015). *Inceptionism: Going Deeper into Neural Networks.* Retrieved from https://ai.googleblog.com/2015/06/inceptionism-going-deeper-into-neural.html. Accessed on October 1, 2018.

Neal, D. M. (2010). Emotion-based tags in photographic documents: The interplay of text, image, and social influence/Les étiquettes basées sur des émotions dans les documents photographiques: l'interaction entre le texte, l'image et l'influence sociale. *Canadian Journal of Information and Library Science, 34*(3), 329-353.

Niederer, S. (2018a). *Networked images: Visual methodologies for the digital age*. Amsterdam, Hogeschool van Amsterdam. Retrieved from https://pure.hva.nl/ws/files/4959407/networked_images_1_.pdf. Accessed on October 1, 2018.

Niederer, S. (2018b). The Study of Networked Content: Five Considerations for Digital Research in the Humanities. *Big Data in the Arts and Humanities: Theory and Practice.* Boca Raton, FL: CRC Press, 89-100.

Mannay, D. (2015). *Visual, narrative and creative research methods: application, reflection and ethics*. London, UK: Routledge.

Paglen, T. (2016). Invisible images (your pictures are looking at you). *The New Inquiry, 8*. Retrieved from https://thenewinquiry.com/invisible-images-your-pictures-are-looking-at-you. Accessed on October 1, 2018.

Pauwels, L. (2011). An integrated conceptual framework for visual social research. In Margolis, E. and Pauwels, L. *The SAGE handbook of visual research methods*, 3-23. London: SAGE Publications. DOI: 10.4135/9781446268278

Pearce, W., Özkula, S. M., Greene, A. K., Teeling, L., Bansard, J. S., Omena, J. J., and Rabello, E. T. (2018). Visual cross-platform analysis: digital methods to research social media images. *Information, Communication & Society*, 1-20.

Prosser, J. (1998). *Image-based research: A sourcebook for qualitative researchers*. London: Routledge.

Ricci, D., Colombo, G., Meunier, A., and Brilli, A. (2017). Designing Digital Methods to monitor and inform Urban Policy. The case of Paris and its Urban Nature initiative. In *International Conference on Public Policy (ICPP3)*. International Public Policy Association. Retrieved from https://core.ac.uk/download/pdf/141690394.pdf. Accessed on October 1, 2018.

Rogers, R. (2017). *Memes as platform content*. Project worksheet. Digital Methods Winter School 2017. Retrieved from https://digitalmethods.net/pub/Dmi/WinterSchool2017/DMIR_2016_worksheet7_platform_content.pdf. Accessed on October 1, 2018.

Rose, G. (2016). *Visual methodologies: An introduction to researching with visual materials*. London, UK: SAGE.

Rubinstein, D., and Sluis, K. (2008). A life more photographic: Mapping the networked image. *Photographies, 1*(1), 9-28.

Rubinstein, D., and Sluis, K. (2013). Concerning the undecidability of the digital image. *Photographies, 6*(1), 151-158.

Steyerl, H. (2009). In Defense of the Poor Image. *E-Flux Journal, 10*(11). Retrieved from www.e-flux.com/journal/10/61362/in-defense-of-the-poor-image. Accessed on October 1, 2018.

Steyerl, H. (2013). Too much world: Is the Internet dead? *E-Flux Journal, 49*, 1-10. Retrieved from www.e-flux.com/journal/49/60004/too-much-world-is-the-internet-dead. Accessed on October 1, 2018.

Thelwall, M., Goriunova, O., Vis, F., Faulkner, S., Burns, A., Aulich, J., Mas-Bleda, A., Stuart, E. and D'Orazio, F. (2016). Chatting through pictures? A classification of images tweeted in one week in the UK and USA. *J Assn Inf Sci Tec*, 67, 2575-2586. DOI: 10.1002/asi.23620

Van Leeuwen, T., and Jewitt, C. (2004). *The handbook of visual analysis*. London: SAGE Publications.