Deconstructing the cloud: Responses to Big Data phenomena from social sciences, humanities and the arts

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Abstract
The era of Big Data comes with the omnipresent metaphor of the Cloud, a term suggesting an ephemeral and seemingly endless storage space, unhindered by time and place. Similar to the satellite image of the Whole Earth, which was the icon of technological progress in the late 60s, the Cloud as a metaphor breathes the promise of technology, whilst obfuscating the hardware reality of server farms and software infrastructure necessary to enable the proliferation of (big) data. This article presents projects from the fields of humanities, social sciences and the arts that formulate a response to Big Data and its human and automated practices, from data analytics dashboards to critical reflections on smart technologies and objects.

Keywords
Big Data, visual arts, tracking, crowdsourcing, visual analytics, Internet of things

The promise of technological progress that surrounds the realm of Big Data, produced by global networks connecting people, things, financial flows, and consumption habits, harkens back to the era of the 60s, when space travel and its NASA imagery inspired many works of art and activism. A famous artwork from that era is Charles and Ray Eames's prophetic film, 'Rough sketch for a proposed film dealing with the powers of ten and the relative size of things in the universe' (1968), an interstellar roller-coaster ride by means of a vertiginous zoom that traverses molecular, human, and cosmic planes. The film features a wide shot of the earth, which had been so ardently campaigned for by Stewart Brand two years earlier. Brand, inspired by Buckminster Fuller's call for better depictions of the round earth, strove to convince NASA and the Russians to use their satellite photography technology to "finally turn the cameras backward" towards the earth (Brand, 1976; Leonard, 2003). He printed a few hundred buttons and posters with the question, "Why haven't we seen a photograph of the whole Earth yet?" (see Figure 1), which he sent to NASA and US government officials and sold personally on the campuses of the University of California Berkeley, Stanford, Harvard, and MIT. Stewart Brand later became famous for his monumental 'Whole Earth Catalog,' the seminal 1968 book of do-it-yourself (DIY) counterculture that offered descriptive and instructional entries on all varieties of eco- and techno-futurist practices, from organic farming and wind power generation, to desktop publishing and electronic synthesizers. Steve Jobs would later refer to the 'Whole Earth Catalog' as a paperback Google, existing 35 years before the search engine came into existence

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The catalog’s first issue (1968) was adorned with that seminal photograph of the whole earth, seen from space. Once a novelty, this view of the earth has been widespread over the decades, and further mainstreamed in the 2000s by the visual characteristics of Google Earth and Google Maps. These applications have similarly sparked a wide variety of artistic and scholarly responses, varying from adding data layers (Parks, 2009; United States Holocaust Memorial Museum, 2009), to visual explorations of anomalies in ‘texture mapping’ (Valla, 2012) and festive live renditions of the now common ‘tiled’ map imagery (Moniker, 2011). The earth as seen from outer space today may still function as a techno-historical perspective on contemporary visual and political frames of scalability and technological innovation, developed in the realm of science and the arts, and inspired by the current proliferation of data.

Its present-day equivalent, the visual and textual symbol of the era Big Data, is not a victorious lens on the world, but rather takes shape in the ephemeral image of ‘the Cloud.’ The Cloud is a metaphor for a seemingly endless storage space, unhindered by boundaries of time and place. As such, it is also a euphemism that obfuscates the “planetary-scale” of the hardware and software infrastructures that are necessary to deal with omnipresent data collection and perpetual computer connectivity (Metahaven, 2012). The research projects and art works presented here provide novel responses, directly and implicitly, to the era of Big Data and its human and automated practices such as crowdsourcing and data analytics.

**Behind the scenes of websites and platforms**

By lifting up the polished interfaces of our everyday technology, research and software projects such as *Contropedia* (2014) and *Floodwatch* (2014) provide behind-the-scenes views of everyday web destinations. With respect to Contropedia, an online encyclopedia is an unlikely place to go looking for controversies. The
collaboratively authored encyclopedia project Wikipedia, however, offering the complete editing history and talk page for each article, provides views of collaborative knowledge production. With these openly accessible history tabs and discussion pages, and furthermore its intricate administrative systems of editing policy, software robots and tool-assisted humans (Geiger, 2010; Niederer & Van Dijck, 2010), it is a place and platform par excellence to map conflict and controversy dynamics.

Researchers, programmers, and designers of four universities working together in the context of an EU-funded project Electronic Maps to Assist Public Science (EMAPS) have created Contropedia, an analytical platform that offers novel visual analyses of the instances and objects of contestation within Wikipedia articles (see Figure 2). Their key orientation towards these inquiries and their utility is that conflicts on Wikipedia “often reflect larger societal debates” (Borra et al., 2015).

Contropedia, presently developed for both the public and specific users such as scientists and decision-makers, aims to extract such social controversies from Wikipedia and provide new insights into these through visualization tools. Building its metrics on those of Wikipedia itself, and combining real-time data about editing and discussion activity, “Contropedia,” its founders assert, “will allow for a deeper understanding of the substance, composition, actor alignment, trajectory and liveliness of controversies on Wikipedia” (Barcelona Media et al., 2014).

Where Contropedia reveals the contentious dynamics of collaborative knowledge production which are hidden behind the article view of Wikipedia, the browser extension Floodwatch (Figure 3) identifies and documents the usually invisible algorithmic dynamics that direct the advertisement selection during the split-second when you open a website. The browser extension, with its tagline “You are not your browser history!,” collects all advertisements served to you when surfing the Internet and then donates this data to researchers analyzing ad targeting. The researchers aim to create the largest available dataset on advertising, to “increase[e] awareness of how advertisers track your browsing behavior, build their version of your online identity, and target their ads to you as an individual” (Office for Creative Research and Soltani, 2015).

Similar views are provided by Ghostery, an anti-tracker browser plug-in that shows the alarming amount of activity taking place behind the scenes of a website visit, offering you also the opportunity to read about these companies and decide whether you wish to block (a selection of) these newly identified, ‘invisible’ tracers and trackers (Ghostery.com). The publicly available Tracker Tracker tool by the Digital Methods Initiative (Amsterdam), which is built on top of Ghostery, aims to render visible parts of the cloud, expanding its view from ad servers to include widgets, social plug-ins, and other “cloud technology” (Digital Methods Initiative, 2013; Martijn, 2013). Enter up to 100 websites into the tool and receive a list of all the little pieces of software loading in the websites.

**Visual analytics of platform content**

The images created and uploaded to the web by individuals account for innumerable quantities of files added daily into global circulation. With the rise of photography-driven platforms beyond Flickr, such as social media platforms Instagram and Pinterest, visual blogging platform Tumblr, and (Facebook) profile picture-based dating app Tinder, the new self-portrait (the ‘selfie’) is increasingly an object of scientific analysis and critique (Keenan and Steyerl, 2014; Losh, 2014; Selfie Researchers Network, 2014; Wendt, 2014). The project ‘Selfiecity’ by Lev Manovich et al. (2014) explores such an approach to this new photographic genre, and presents a comparative visual analytics of selfies in five different cities across the world.

Selfiecity is a visual analytics platform for selfies, which analyses a total of 3200 Instagram selfies from New York, Moscow, Berlin, Bangkok, and Sao Paulo. The aim of the project is to systematically investigate patterns in selfie collections, on a demographic (do only young women take selfies?) and aesthetic level (e.g. how to pose and make facial expressions). Selfiecity also presents visualizations of its findings (yes, men take selfies too, but the majority is taken by women), called ‘Imageplots’ (Figure 4). The ‘Theory’ section of the platform is dedicated to essays about photography and the self-portrait in particular. Lastly, an interactive dashboard called ‘Selfiexploratory’ offers the possibility to explore, re-order, and sort the collection through its various rankings and filters.

![Figure 3. Screenshot of the browser plug-in Floodwatch. Courtesy of the Office for Creative Research & Ashkan Soltani.](https://floodwatch.o-c-r.org/) (last accessed 1 July 2015)
Living with dumb things

In his work titled ‘The Universal Addressability of Dumb Things’ (Figure 5), British artist Mark Leckey, winner of the prestigious Turner Prize in 2008, paints a near future in which so-called ‘smart objects’ have the capacity to self-organize. This fading of the boundaries between the animate and inanimate leads him to paint a world of techno-animism conceptualized further for an exhibition proposal, which he made available on YouTube. At first glance, the video sketch ‘A proposal for a show’ could be described as an eerie preview of a near-future Internet of things, in which “phones speak back, refrigerators suggest recipes, and websites seem to predict what we want” (Leckey, 2009). However, the exhibition’s themes and concerns resonate far beyond this single concept, as the project puts forward a monumental network of relationships and cross-references by juxtaposing artworks and artifacts culled from the gamut of history (Smith, 2013). A Soviet dog space suit and a ‘Singing Gargoyle’ are shown together with a replica of William Blake’s death mask and a Cyberman helmet from ‘Doctor Who,’ drawing analogies between the transformation of technical objects into communicators towards the realm of totemism. In conclusion of the exhibition in Brussels in January 2015, Leckey decided to xerox the whole project, resulting in ‘UniAddDum,’ a collection of assorted 3D printed copies, 2D cardboard cut-outs, photographic reproductions and other forms all duplicating the original exhibit. In an assertedly pop manner he calls these objects “dupes,” and presents them as an “exhibition within an exhibition” (Leckey, 2010).

The quantified event

In contrast with these playful duplicates stands the repetitive imagery presented in the installation ‘Deep Play.’ The installation by the German artist Harun Farocki (1944–2014) consists of 12 different perspectives (each with its dedicated screen) of the 2006 ‘Italy vs France’ Fifa World Cup soccer final in Germany, which was watched by approximately 1.5 billion viewers simultaneously (Farocki, 2008). The 12 screens meticulously deconstruct and reconstruct this mass media event. On one screen we see the game as it is broadcasted. On others we see live feeds from different angles and spaces in the stadium streamed in sync with the game, showing bored guards, corridors, back-rooms, parking lots, vexed coaches, 2D and 3D graphs, vector charts, and animation sequences. Layers of quantified data including distances and speeds of runs by the players, percentages of each team’s ball possession, number of shots taken—in fact every conceivable element of the match—are concurrently being analyzed (Figure 7) and broadcast simultaneously.

Farocki is known for his documentary non-narrative audiovisual essays on the politics of imagery, in which he interrogates institutions such as cinema and television (often with a rather dry, Brechtian voice-over).
Figure 5. Installation view *UniAddDum*, 2014, by Mark Leckey. Courtesy of the artist and Gavin Brown’s enterprise. See also the video *Prop4aShw*, which is available from Leckey’s YouTube channel at https://www.youtube.com/watch?v=v5XCscECpAo (accessed 1 July 2015).

His installation ‘Deep Play’ inundates the viewer with a network of (played back) real-time data and imagery. This screen architecture effectuates the removal of the viewer of the game, and instead turns our attention to the apparatus that mediates the action, quantifies the process, and shapes our perception.

Repetition and modulation of war stories

Artist Omer Fast in his work addresses similar issues with the mediation of events, in his case related to the conventions of journalism, where he investigates the stability of the structures of narration and storytelling. In multiple works he questions the propensity for converting traumatic and violent events into easily digestible media bytes. The short film ‘5,000 feet is the best’ (Figure 7) is based on conversations that the artist had with a former Predator Drone operator (Fast, 2011). In this and other works, Fast interrogates conducting war at a distance, including the psychological effects on its operators and spectators.

The work is shown as an endless loop; however, the repeating parts are not symmetrical and instead seem constantly modified. An example is the reversal he creates of the American occupation of Iraq, portraying an American family navigating through checkpoints of a seemingly Chinese occupying army. The effect is unnerving as all the key visual elements like the car and the environment are typically American. In ‘5,000 feet is the best,’ Fast delves into the trauma of the drone operator but also exposes the possible delusions of language and images and their related degrees of interpretation.

Conclusions

Where the cloud—just like the image of the ‘whole earth’—functions as an optimistic symbol of technological progress, the aforementioned projects offer critical assessments of this big data phenomenon and its associated practices. As Steward Brand’s present-day activist (and hippie) counterpart, Jaron Lanier, writes in the preface to his manifesto ‘You are not a gadget’:

It’s early in the twenty-first century, and that means that these words will mostly be read by nonpersons (…). The words will be minced into atomized search engine keywords within industrial cloud computing facilities located in remote, often

Figure 7. Still from the installation Deep Play, 2008, by Harun Farocki. Courtesy of the artist. Video documentation of the installation is available at https://vimeo.com/61647951 (last accessed 1 July 2015).
secret locations around the world. They will be copied millions of times by algorithms designed to send an advertisement to some person somewhere who happens to resonate with some fragment of what I say. (2010: iv)

Analytical interfaces on platforms and data collections show the individual and collaborative dynamics of content as well as their formal features. Autonomous art projects provide critical views on smart technologies in domestic or global settings, ranging in the examples here from smart home appliances to drone warfare. In an era that produces content mostly for machines, to paraphrase Lanier, such analytical and aesthetic views offer a much-needed close reading of the data universe we both create and inhabit.

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