

Google Street View: Digital Mapping, Glitching and Social Documentary

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Google Street View (hereafter GSV) is a digital application that was launched in 2007 and enables the user to zoom in from the traditional cartographic bird's-eye view to an immersive 360° street level environment. The result, with its continuous and frictionless interface, is a virtual version of a cartographic tool where the user can immerse themselves fully in a panorama of their chosen environment. These ostensibly seamless horizons are captured using stitched together images taken from Google's infamous street view cameras on 2.5 metre photographic masts attached, for the most part, to the roofs of various vehicles. The resulting images can be unsettling and quite often provoke a voyeuristic response in the viewer. Most notably, the incidental and everyday actions of individuals are captured in the harvesting of countless images by Google's cameras. Almost immediately, artists began to appropriate these images into their own artwork. Artworks, such as those discussed in this article, have emerged that use this technology to explore the social implications of GSV. Most particularly the unveiling of glitches that are captured by GSV unsettles the seeming objectivity of the camera and upends the balance of power and control that is then transferred back to the social practice of mental mapping: a cartographic practice gleaned by moving through the landscape.

One of the defining features of GSV is its adherence to the narrative logic of human organization. As Sarah Pink writes, GSV images are "consumed through the experience of movement across the screen, and it is here that the question of the interconnected senses becomes most central" (11). GSV is experienced through a

sense of movement. The fused images are not static but streamlined as the user flows from one environment to another: “Google Street View offers another perspective, which is closer to the metaphor of knowing in movement. It affords viewers possibilities to use their existing experiences of environments to sense what it might be or how it might feel to move through the ‘real’ locality represented on screen” (11). In that respect, online environments such as those experienced through GSV (and VR) can be analysed through the lens of place-based discourse. The tension between embodied mapping through movement and the seemingly objective practice of observation using GSV as an all-seeing eye illustrates the fraught relationship between technology and bodily materiality. Negotiating a landscape has been the subject of many technological innovations (such as surveillance), and there has been an emergent aesthetic that explores the themes of technology and observance in contemporary art practice.

Building on a history of street photography (as seen in the works of Paul Strand, Walker Evans, Dorothea Lange and Robert Frank) but also emphasising the vastly different scale that Google Street View generates, artists sought to incorporate into their work, not just the differing viewpoints that the technology offered, but also the vast archive of strangely disconcerting images of the everyday. This paper will examine the impact of GSV on how landscape (and our place within it) is represented and the repercussions for the aesthetics of space in our contemporary digital culture in the work of photographers Michael Wolf, Doug Rickard, John Rafman and Emilio Vavarella. The impact of digital applications such as GSV on aesthetics is a new phase in an ongoing conversation between artists and technology. The use of a distinctly digital aesthetic in an artwork allows the artist to comment directly on what is arguably the most fundamental and ground-breaking change in our contemporary culture: digital technology and its corresponding applications. The work that develops and emerges organically from that tension between art and technology is a crucial one to unpack, particularly given the repercussions of the emerging digital aesthetic on what is becoming a crisis in spatial and environmental discourse.

What these images are in terms of their genre is also a pertinent one. They sit somewhere between photography and photomontage. Not without controversy, artist Michael Wolf received an honourable mention at the World Press Photo Awards in 2011 for his project, *Street View: A Series of Unfortunate Events*. The series was constructed by taking photographs (of his own computer screen) of GSV images that

he had chosen from the application. This newfound ability to take street photography without actually being out in that specific environment ushered in new conversations about the issues of voyeurism and surveillance based on the use of an image intended for one purpose but appropriated for artistic purposes. The images were appropriated without the permission of the subjects and whilst the faces of the figures in each image are blacked out (as they would be in GSV), there is in the series a confirmation of sorts that the strange juxtaposition between the voyeurism of the viewer and the anonymity of the participant evoke the tension between technology and subjectivity. The anonymity of the subject in the image suggests that both the unknowability of the other and the pervasiveness of technology are an important factor in drawing attention to the issues of societal injustice as seen in social documentary.

Another instance of social documentary where GSV datasets were used to explore themes of injustice captured by technology is Doug Rickard whose exhibition, *A New American Picture*, depicted the desolation and isolation of communities that live below the poverty line. These gritty, piloted, surveillance images depict the intense isolation and trauma of figures that are marginalised. But they also speak to a history of social photography that can be seen as exploitative: capturing and framing the lives of the less fortunate for the singular purpose of creating a visual aesthetic deemed pleasing for others. Whereas this method of documenting the less fortunate has been confronted with this criticism historically, the use of GSV datasets brings the moral ambiguity of the practice to the fore. In many instances, for example, there are images taken that capture an individual in inappropriate situations or behaving suspiciously or aggressively either for the benefit of the GSV camera or without any awareness of it. Although the notion of surveillance and the tools that form a part of the surveillance apparatus (such as CCTV) have been around for a few decades, only recently has the technology allowed for complete tracking of an individual's movements. An early example of an artistic response to surveillance in new media was the *iSee* project created by anonymous activists, The Institute for Applied Autonomy in 2004. The activist group created a web-based application that contained user-generated data which established the positions and tracking of surveillance cameras in New York. Users marked the beginning and endpoint into the online software and were instructed as to where the points of surveillance along their journey were situated. They could then print off a map so as to avoid being in the

range of the cameras. The artwork was a comment on the pervasive increase in social control and the attempt of the individual to subvert or push back against that wider state (and anonymous) surveillance that has become pervasive in public spaces.

While surveillance is clearly an important theme in artworks that draw on digital technology and applications such as GSV, the spatial or cartographic element is also evident. While the material gathered by Google is essentially extraneous data in the form of images that correspond to a particular point in a geographical area, the markers are placed in a way that allows the user to visualise the map as an embodied spatial experience. Exploring the earth from a global or god's eye perspective plays a large part in nature aesthetics historically. The impact of the Arts on scientific understanding of environment has always been evident in the collaboration and interaction between artists and scientists. Early modern attempts to understand the cosmos is evident in grappling with the displacement of the earth and the expansion of the universe in works such as Copernicus's *De Revolutionibus Orbium Coelestium* (1543) and Galileo's *Dialogo sopra i due massimi sistemi del mondo, Tolemaico e Copernicano* (1632). It has been argued that the scientific revolution of the Renaissance and Early Modern period has been largely influenced by the artistic development of linear perspective (Panofsky, 1927; Edgerton, 1975; Alpers, 1983). Albrecht Dürer had co-created (alongside cartographer, Johannes Stabius and mathematician and astronomer, Conrad Heinfogel) two-star maps in 1515 from the vantage point of the northern and southern hemispheres which depicted the 1022 stars in Ptolemy's *Almagest*.¹ Understanding where we, as embodied and material entities, sit within the wider landscape is an old question. What is different in the images addressed in this article, and, in particular, the Vavarella's series is the intervention of technology at the point where surveillance has become endemic. These images of Wolf, Rickman, and Vavarella all frame or emphasize the everyday omnipresence of surveillance, not only triggered by us, but pervasively present in the landscape with or without human presence. GSV has a structure in place that seeks to capture the incidental in contrast to, for example, the criminal. It is a step further in the use of technology in gathering vast amounts of data for largely nondescript purposes.

¹ Written by Claudius Ptolemy in the 2nd century, this catalogue of the stars was the accepted astronomy model until Copernicus.

Contemporary artists have, in recent years, wrestled with how to represent scientific data in their work. Diana Thater's *Six Color Video Wall* (2000) for example is made up of six plasma screen displaying six slowly rotating suns. The images were digitally animated from a sequence of NASA photographs taken by the Solar and Heliospheric Observatory (SOHO). The images had already been separated into the component colours, red, green and blue (for scientific investigation) and Thater added the complementary colours, cyan, magenta and yellow. John Klima's installation *EARTH* (2001) goes further with a geo-spatial visualisation system that uses data layers (from geographical surveys, satellite images, weather patterns, etc.) projected onto a spherical ball in stratified layers. More recently Chris Milk has made an online interactive video piece in collaboration with musicians, Arcade Fire, called *The Wilderness Downtown* (2011). Written in HTML5, and using GSV and Google Maps API, the short film allows the user to enter the environmental landscape of memory. After typing the address of your childhood into the browser, the interactive video allows the user to be a part of a personalised video experience. The technology intersects with the users personal memories of a particular environment in a fascinating new layer that can be added to the personal online archive of an individual's life. These three examples illustrate the move in contemporary art to harness scientific discovery to comment on landscape and environmental representation.

An artist using the same material is Jon Rafman. Rafman has exhibited found images gleaned from GSV in his collection *9-Eyes* (2009-ongoing) which has been exhibited online and as an exhibition (*The Nine Eyes of Google Street View*) in the Saatchi Gallery, London.² The artist trawls through the GSV data to find surprising instances that capture the surreal moment when someone (or something) is caught unaware, echoing the uncanny notion of unveiling. Images such as *A reindeer running down Rv888, Norway, 2010* record a moment that would otherwise have escaped the viewer of a reindeer running down a stretch of highway between Bekkarfjord and Hopseidet in Norwegian Lapland. His images are untouched leaving, for example, the Google navigation tool at the top left-hand corner of the image. As the artist commented:

The work is connected to the history of street photography [...] but also to the 20th-century ready-made movement. So leaving those artefacts in the image is

² The number nine in the title refers to the number of cameras that are mounted on the cars.

extremely important. In the bottom-left corner of each picture is a link that says, 'Report a problem'. Maybe in the middle ages you passed somebody in trouble on the road and were confronted with the moral dilemma of whether to help them. Then came a time when you could call the police. Now we've reached the point where it's a hyperlink. That represents just how alienated we've become from reality. (in Walker, *Independent*, 25 July, 2012)

The process illustrates how digital tools are being used to expand what our idea of the nonhuman world is. Artists have previously used digital tools and harvested data to think about landscape aesthetics in new ways.

An emergent intersection between GSV technology and art is the digital glitch or error. The art of the digital error is the ultimate enactment of the naturally emergent artform. Its use in glitch art is an important reminder that new media art can not only endlessly replicate but create an image that is representative of a digital world. One of the striking aspects of the use of GSV technology is the emergence of a frailty or a notion of disconnection brought about by the mistakes or glitches that seep into what is otherwise an omnipotent and global technology. An artwork that highlights the decentralised and participatory nature of glitching and how it intersects with digital technology is Emilio Vavarella's *The Google Trilogy*. This three-part project consists of *Report a Problem*, *Michelle's Story*, and *The Driver and the Cameras* that feature GSV technology. The series use the technology to explore themes of cartography and power as Vavarella writes on this website: "The end-goal of Google mapping is nothing more than the oldest archetypal obsession of any mapping effort: that of mapping a territory until the map itself becomes a territory in its own right" (<http://emiliovavarella.com/archive/google-trilogy/>). There is an attempt in the process of mapping and representation to make new worlds and this distancing is where the tension emerges between the subject of the technology and the communality or empathy that emerges in social documentary.

The first, *Report a Problem*, is a series of 100 digital photographs that plays on the feature in the GSV screen that allows the user to report technical errors. Vavarella travelled to the (online) landscapes where an error had been reported and captured the scene before Google repaired the glitch. The errors can result in unnatural imagery and intense, vivid colours that would not be found in commonly accessed landscapes. These glitched landscapes resonate as fractured segments of imperfection in an otherwise streamlined software program. The series is colourful

due largely to the errors in colour attribution that run through the photographs. There are washed out rural and urban scenes and, in each photograph, the omnipotent Google buttons frame and surround the landscape. The scene is heavily mediated and functional in contrast to perhaps a traditional landscape where the aim was to immerse the viewer in the environment. These street view images seek to remind the viewer that no matter how extensive the available information is on a landscape (bordering on VR), it is still not that landscape and mistakes happen. The hyper realism offered by the digital technology in this case falters as if to break with conventional relationship between the digital environment and our experience of the material (or at least non-digital) one.

Ingraham and Rowland point out that resistance to the ubiquitous use of GSV surveillance has emerged in the form of “microactivist performance-events by people who stage tableaux vivants for the passing GSV cameras” (212). Their article examining performance that occurs for and in front of GSV cameras, such as Kelly Gates’s *A Street with a View* (2008), notes that Jon McKenzie’s definition of “performance assemblages” which incorporate cultural, organizational and technological performances is an apt descriptor for the phenomena of the interaction between the GSV camera and those resisting the surveillance that seems totalising. McKenzie draws on Deleuze and Guattari to name this phenomena machinic performances (216). For Ingraham and Rowland, these machinic performances denote the “dispersed assemblages that exemplify the entangled nature of cultural, organizational, and technological performance types” (216). Jon McKenzie labels the active resistance to technological surveillance, as seen in these performances that subvert the assumed objectivity of digital technology, as hacktivism. This expands on the notion that hacktivism, what he describes as “electronic civil disobedience” is a form of social activism (22):

I will define machinic performances as arising whenever different processes ‘recur’ or communicate across diverse systems, thereby creating performances that escape subjective control and even objective analysis. Machinic performances do not occur at discrete performative sites; instead, their occurrence is distributed. They happen at multiple sites through multiple agents, both human and technological. (22)

Whereas McKenzie discusses machinic performances in relation to the 1986 Challenger Shuttle Disaster, for Ingraham and Rowland, the GSV performances can also be categorised in the same manner because they incorporate not just the

cultural and organizational performance but also technological performance, given the clear cooperation with Google. They write:

This is not just a matter of supposing a distributed agency to coexist between people and things, but of acknowledging that machinic performances transpire across the wider territory of biopolitics and the control over life and non-life. It is no wonder, then, that some of the most intense performances undertaken for GSV cameras have involved staging tableaux vivants of life and death itself. (217)

The same emphasis is evident in *Michele's Story*, Vavarella's second instalment in *The Google Trilogy*. These performances, under the omnipresent gaze of the GSV camera, reflect the embedded body in a network of information and data dispersal and retrieval that has become the defining feature of the technological age.

Michele's Story is the second installation in the project and a collaboration with Michele, a paralysed man with memory damage. Google Street View, in this case, is used to "precariously reconstruct a single human journey by recovering snippets of stolen and dehumanized life" (<http://emiliovavarella.com/archive/google-trilogy/micheles-story/>). The collection points to the instability of memory and quite often its reliance on visual aids. Issues of ownership, censorship and how the user can extrapolate or create narrative from the use of such technology arise and are treated in these artworks. Michele's story and, indeed, all three instalments in the project rely on the mapping systems produced by a private company.

Just as Google has taken control of urban and rural environment totalising their monopoly on the control and organisation of data, there appears to be a crack in the polished gleam that is their digital view on the world. There are mistakes that highlight the vulnerability of the technology that has become so pervasive in our lives. The power of Google software is in its seamlessness and ease of use. As Ingrid Hoelzl and Rémi Marie have pointed out, the use of Google maps as the default global mapping system has emerged from the company's "ability to reconcile the cartographic and photographic modes of representation" and on "its ability to build the technical tools that allow a smooth 'landing' from one to the other, as if they were and always had been operating in the same symbolic space" (261).

The glitches that crop up in the functioning of the software prove to be a fertile ground for appropriation by media artists. The project, and many others, disclose the fallaciousness of Google software. The final installation in the series examines the use of blurring to disguise facial features and the (relatively frequent) system error

that overlooks faces. *The Driver and the Cameras* is a series of photographs that have escaped Google censoring procedure to protect identity. The technique has been used before by, for example, artist Michael Wolf's *Fuck You* series in 2011 which consisted of a sequence of shots capturing people sticking their finger up at the camera. The images that Vavarella uses, however, are of the drivers of the GSV car, who are willful participants in the use of the Google mapping software. This blurring of facial features and other identifiable data refers the viewer back to the construction of the image. As Hoelzl and Marie have pointed out: "the digital artefact – the stuttering and stammering of the image, as Deleuze would argue [...] can be understood as the manifestation of a digital aesthetics that is medium reflexive, in the sense that it reflects the means by which the image has been processed and distributed" (264). The opening up of the framework upon which the image is built is a core constitute of this type of glitched art. On the one level, it reveals the underpinning of information that is generally thought of as objective, and on the other, its portrayal of the landscape and the actors within it reveal in a type of beauty that is a part of the consistent failure to capture landscape in any real and meaningful way. It is worth returning to Hoelzl and Marie as they aptly argue that new media art has changed the way – the fixed assurance – with which the image of our surrounding environment could be fixed:

Somewhere along the temporal process that led from the stable subject-object relationship of the modern era to the mutable object-object relationship of the digital era, the fixed relation between world and image that underpinned the photographic paradigm of the image was gradually replaced by the dynamic relation between data and data that is the foundation of the algorithmic paradigm of the image. Somewhere within this cybernetic data-to-data relationship, the image still intervenes. (266)

This is one of the defining features of the art practice that is immersed in digital technology. Where the image and digital technology intersect is now "unstable algorithmic configuration of a database in the form of a programmable view" (266). The essence of the glitch in art that intersects with digital technology is to frame that instability in the form of an image. Vavarella describes a glitch as "a sort of digital fingerprint of a particular technology" whose use is directly linked to the "technology from which it derives" (11). The machine is essentially a collaborator in the process allowing different avenues for representation that the artist would not have otherwise considered. For Vavarella, "a glitch reveals what lies beneath the apparent visibility and fluidity of the technology surrounding us" (11). And technology is pervasive, not

just in surrounding the human as subject but as a significant moment. In her book, *The Internet of Things*, Jennifer Gabrys mentions “the year when Internet-based machine-to-machine connectivity surpassed that of human-to-human connectivity” (184). The sheer volume of data that emerges from the Internet and the networks that operate independently from human within that modality are testament to the groundbreaking phenomena that the digital art aesthetic encompasses.

Report a Problem and *The Driver and the Cameras* are examples of how glitches intersect with the internet as an immense database: an ecosystem in itself. Within this ecosystem, the errors that are made should not be seen in a negative sense but an open and fruitful version of the multiplicities and complexity that celebrates difference and divergence. In *Report a Problem*, the glitch in the landscape reminds the viewer/user that these images are aesthetic renderings of landscapes, but it comes with a built in option to correct or report an issue as the viewer sees it. As with the interdependent internet of things, correction and regulation is dispersed throughout the system. The opportunity to report a problem means that the images that were produced with a mistake built into them are to be rectified and discarded. The sanctification of discarded images is not new in historic process-based art movements. What is different here is the direct relation between the system and the user in the original sense when the user reports the problem and in the second sense when the glitched image is appreciated as a work of art rather than a discarded item.

With *The Driver and the Cameras* the onus is on the driver of the GSV vehicles to avoid the stitched images that the GSV camera takes. Even if their faces are blurred by the face recognition technology, there is a sense that the mistake is not just on the part of the technology but also on the human element. As both attempt to uphold the structure of which they are a part, through the exposure of the glitch and the revealing of the driver, the system itself is called into question. These glitches show that GSV is far removed from the seemingly objective cartographic experience of aerial photography, for example, and falls more naturally into our desire for narrative. As Aaron Shapiro points out, it is the street level imagery that differentiates GSV from other cartographic methodologies:

Whereas aerial imaging and its vertical gaze provide a disengaged “view from nowhere” of the earth’s surface and the array of human activities that take place there (civilian and military, urban and infrastructural, natural and meteorological, etc.), street-level imagery is always explicitly grounded in a somewhere; its emphasis on the particularities of place rather than cartographic abstractions of

space makes it seem progressive, absolved from the visual-semiotics of scientific rationality or objectivity. (1202)

GSV makes a landscape much more real in the mind of the viewer than aerial imagery and so is more fulfilling as a nature aesthetic. It can be seen as soothing, easy to understand, the viewer is intrigued and drawn into the image by the human figures. It follows conventional narratives outlines: who are these people? What are they doing there? The glitching of the image reminds the viewer that this is not a conventional image; it can be manipulated to reverse the outcome that created these particular forms. Algorithms can search for faces and blur them out. GSV can and has contributed to the study of big data. Data harvesting has generated new ways of categorizing spaces which can act detrimentally in many ways engaging in the type of place-sorting that reinforces racial and social biases. As Shapiro writes: “virtual mapping applications like GSV illuminate novel configurations of sociality and surveillance that both promise and threaten to reorganize social landscapes, to reaffirm or undermine our normative categorizations of space and place” (1215). Glitching is just one method for teasing out the assumption of infallibility that much algorithmic data now finds itself with.

These are images garnered or instigated from errors in a system that is thought of as being in the service of human beings and yet Glitch art reveals a more independently-minded if not essentially self-serving system. *The Google Trilogy* clearly shows a digital and pixelated aesthetic and some pieces (*Report a Problem* and *The Driver and the Cameras* more so than *Michele's story*) show the random error occurrence that is the defining feature of glitch art. Many contemporary new media artists have used the idea of the glitch and incorporated it into their own work. There is an element of the tinkered with – that hacktivist element – that essentially emerges from the glitch but is incorporated within the broader digital aesthetic. The mistaken images of the GSV drivers or landscape speak to a subjective relationship that is uncertain where memory and sensory embeddedness cannot be assured. Landscape is, no doubt, a real and vital subjective experience. However, as that experience is interlaced with ever-growing virtual experiences of the environment, it is important to think about the blurred lines between the real and the virtual and, in the case of computer mediated landscapes, the very material network that facilitate that experience. As Lisa Parks argues:

If we are willing to take seriously the fusion of the biological and the technological, it is important to consider not only how consumer electronics become human prostheses but also how automated facilities on the outskirts of cities that are dug deep into the dirt and surrounded by plants and wildlife – seemingly in the middle of nowhere – are integral to broadcasting in the digital age. (157)

Embedding landscape representation in its material networks allows for acknowledgement of the materiality of both the landscape and the networks that offer the user unmediated access. The history of representing the landscape in the visual arts reveals its significance as a tool for human identity construction and ideologies. Parks points out this dynamism connecting landscape to social practices, arguing that “rather than approach Earth-observing practices only as *representing* infrastructure sites and processes, we need to understand these practices as *performative acts* [...] which need to be specified and considered” (157, emphasis author’s own). These artists use digital technology to deconstruct and interrogate traditional conventional notions of the landscape and the cartographic tools used to represent it. The artists featured have created innovative and significant new ways to explore, inhabit and ultimately represent the landscape for a new digital age.

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