Article

Critical Surveillance Art in the Age of Machine Vision and Algorithmic Governmentality: Three Case Studies

Claudio Celis

Universidad Academia de Humanismo Cristiano, Chile
ccelis@academia.cl

Abstract

This article explores the political dimension of three surveillance artworks: Rafael Lozano-Hemmer's *Level of Confidence* (2015), Heather Dewey-Hagborg's *Probably Chelsea* (2017), and Trevor Paglen's *Machine Readable Hito* (2017). These three artworks deploy new technologies of machine vision and algorithmic face recognition in order to develop a critical account of surveillance. This article's main hypothesis is that the critical potential of the three selected artworks stems from their ability to render visible a twofold tension that defines contemporary social formations. First, these works nurture a certain ambiguity between two modes of understanding the relation between images and power (representation and performativity), highlighting the difficulties in conceptualising and redefining new critical strategies for artists today. Second, this article highlights the tension between individualisation and personalisation as two parallel tendencies of contemporary power. In this context, the modern notion of political emancipation, grounded mainly on the figure of the individual subject, has to be called into question. The three selected artworks point out the intersection between two logics of power (discipline and governmentality), drawing attention to the limits of the notion of emancipation for a critique of algorithmic face recognition technologies.

Introduction

The theme of surveillance has been gaining popularity in the field of art in the past couple of decades. According to Susan Cahill (2019: 357), since September 11, 2001, “the rhetoric and policies of terror, which Euro-American states heavily manage through surveillance structures” have become central to a logic that justifies “monitoring, policing, controlling, and visualizing bodies.” In this new context, “these forms of elevated vigilance, which impose military surveillance tactics to monitor everyday behaviours, spaces of consumption, and civilian life, have been normalized as essential to conditions of national and global security” (Cahill 2019: 357). In other words, Cahill argues (2019: 358), surveillance has become the “new normal.”

In response, a growing number of artists have begun to challenge the new normal by critically adopting the theme of surveillance as a central aspect of their work. Categories such as “artveillance” (Brighenti 2010), “art and surveillance” (Cahill 2015), and “critical surveillance artworks” (Monahan 2018) have been forged in an attempt to define these new art practices. Torin Monahan (2018: 560) suggests that the blossom of critical surveillance artwork in recent years is changing people's perception about surveillance while allowing them to recognise their own role in surveillance systems. In this new context, Monahan (2018: 560) identifies works that can “enact plays of avoidance,” “expose surveillance practices to heighten transparency,” “interrupt or confound data collection and processing,” and “emphasize viewer's complicity or participation in the regimes in question.” Unlike Berger's (1972) famous “ways of seeing,” critical

surveillance artworks interrogate the political dimension not only of seeing but also of “the ways of being seen in the present moment” (Monahan 2018: 561).

Following the work of Cahill (2015, 2019) and Monahan (2018), this article attempts to explore the political dimension of three surveillance artworks: Rafael Lozano-Hemmer’s *Level of Confidence* (2015), Heather Dewey-Hagborg’s *Probably Chelsea* (2017), and Trevor Paglen’s *Machine Readable Hito* (2017). These three works deploy new technologies of machine vision and algorithmic face recognition in order to develop a critical account of surveillance. As such, they belong to a broader group of artworks that critically examine the relationship between technology, art, and power (Montero and Donoso 2014). This article’s main hypothesis is that the critical potential of the three selected artworks stems from their ability to render visible a twofold tension that defines contemporary social formations. First, these works highlight a growing tension between two modes of conceptualising the relationship between images and power. Traditionally, the social and political role of images has been understood from the perspective of representation (what images signify and how they signify it). The key concept here is that of “mediation”: how do images mediate our relation to the world, normalising certain representations while excluding others? More recently, however, the domain of representation has been challenged by the question of how images operate in the world. The key concept in this case is that of “performativity.” From this second perspective, what matters is not so much what images represent or how they do it but what they perform. Furthermore, as Trevor Paglen (2016) suggests, the shift from representation to performativity is forcing visual artists to redefine the strategies through which art engages with political and social issues such as surveillance. As it will be shown, the three selected artworks remain ambiguous regarding these two modes of understanding the relation between images and power, highlighting the difficulties in conceptualising and redefining new critical strategies for artists today.

Second, it could be argued that contemporary social formations are characterised by a tension between an emphasis on the individual (through algorithmic surveillance and personalisation) and an emphasis on the statistical analysis of populations in which the individual loses its key role (through big data analysis and pattern recognition technologies). Using Antoinette Rouvroy and Thomas Berns’ (2013) notion of “algorithmic governmentality,” this article highlights the tension between individualisation and personalisation as two parallel tendencies of contemporary power. In this context, the modern notion of political emancipation, grounded mainly in the figure of the individual subject, has to be called into question. The three selected artworks point out the intersecting point between these two logics of power, highlighting the difficulties of grasping the notion of emancipation in a context in which algorithmic face recognition functions as a technology of surveillance that is trained on statistical data but then used to individualise particular subjects.

Algorithmic Face Recognition

A key example of how information technologies are transforming surveillance and power relations is algorithmic face recognition. Social media, CCTV, border control, targeted advertising, and police profiling are just some of the many domains where face recognition algorithms are being tested and implemented. From apparently harmless uses such as tagging a photo on social media to ethically dubious applications such as racial or sexual profiling, algorithmic face recognition is becoming a pervasive technology that exemplifies the more general surge of machine vision systems. Coined by Paul Virilio (1994), the term “vision machine” refers to technologies that have successfully managed to automate visual perception. Thanks mainly to the development of machine-learning algorithms, machine vision has become a technical possibility that allows for the automation of complex tasks such as “assembly robots, drones, self-driving cars, automatic border controls, etc.” (Hoelzl 2018: 361).

Nevertheless, it is important to remember that, as Deleuze (1995: 175) puts it, “machines themselves do not explain anything” and that instead one must “analyse the collective apparatuses of which the machines are just one component.” This means that vision machines and face recognition algorithms must be understood as part of the general shift in the logic of power. From this perspective, the technical success behind

algorithmic face recognition unveils a series of political and ethical questions. Most notoriously, the unscrupulous use of this technology by certain institutions has led a series of authors to think of algorithmic face recognition as a return to the “dark ages” of phrenology and physiognomy that restates longstanding power relations through new technical devices (Beller 2018; Edkins 2015; Gates 2011; Paglen 2016; Dewey-Hagborg 2015; Agüera, Todorov, and Mitchell 2017).¹

Jonathan Beller (2018) contends that algorithms are not a neutral technology of pattern recognition but instead a social mechanism that reifies existing class, race, and gender structures.² According to apologists for this technology, the controversies triggered so far by algorithmic face recognition have been the result of a lack of accuracy and hence they can and must be solved by employing better training data sets for machine learning (Zarsky 2011; Buolamwini and Gebru 2018). From this perspective, a properly trained algorithm would be less racist than human interactions and would hence secure a fairer enforcement of power. Conversely, critics of this technology claim that algorithms are instead “automating” racial and class relations, presenting them as “natural” and “objective.” This, Trevor Paglen (2016: para. 22) claims, is the ideological function of algorithmic technology: “to present itself as objective truth, to present historical conditions as eternal, and to present political formations as natural.”³

This means that the apparent objectivity unveiled by statistic calculation is the result of reified class, gender, and racial structures. Patterns of normal behaviour are not natural traits unveiled thanks to the use of algorithms but the result of specific social structures that are transmitted to the machine through the training data sets employed in the machine learning process. In the specific case of face recognition algorithms, these data sets are utilised to train algorithms that can afterwards connect a facial template, a label (“consumer,” “criminal,” “terrorist,” etc.), and a concrete individual.

Between Representation and Performativity

In the context of algorithmic face recognition technologies, art practices can become a powerful tool for developing a critique of surveillance. Nonetheless, this requires redefining the political potential of art in a context in which “the overwhelming majority of images are now made by machines for other machines, with humans rarely in the loop” (Paglen 2016: para. 3). According to Paglen (2016), disciplines such as cultural and media studies have focused strictly on the analysis of images from the perspective of human vision. In fact, these disciplines have advanced a great length in understanding the “ways in which images infiltrate and influence culture, their tenuous relationships to everyday life and truth, the means by which they are harnessed to serve – and resist – power” (Paglen 2016: para. 2). Likewise, art practices have developed “very good tactics and strategies for making interventions into human-human visual culture in order to challenge inequality, racism, and injustice. Counter-hegemonic visual strategies and tactics employed by artists and cultural producers in the human-human sphere often capitalize on the ambiguity of

¹ According to Jenny Edkins (2015: 103), phrenology and physiognomy developed during the nineteenth century and “were based on the belief that internal characteristics of personality are expressed in external physical characteristics.” What is interesting to point out is that the origin of these disciplines coincided with the invention of photography and the mechanical reproduction of images. The new technical inventions “provided the ideal method of recording thousands of images of the face and skull for phrenological or physiognomic examination and analysis” (Edkins 2015: 103). Analogously, computer vision and big data are providing the technical ground for these predictive disciplines to resurge, this time with a recharged effectivity that allows for the “exercise of power on dramatically larger and smaller scales than have ever been possible” (Paglen 2016: para. 8).

² For an extensive study of how algorithms reify social inequality, see Virginia Eubanks (2018).

³ Similarly, Matthew Flisfeder (2018: 471–472) has introduced the idea of an “algorithmic ideology,” according to which “algorithms are not neutral arbiters of information, but are inscribed with ideology through and through.” According to Flisfeder (2018: 472), in order to unveil the ideology of the algorithm, “it is necessary to interrogate the discourses employed in defining the problems and methods used in the design of algorithms, in the set of instructions that they established, and to position these within the political (economic) context of the capital-class struggle.” See also Beller (2018).

human-human visual culture to produce forms of counter-culture” (Paglen 2016: para. 29). These forms of counterculture aim to expand “the field of represented peoples and positions in visual culture” (Paglen 2016: para. 29). They can do so because of the assumption that the “relationship between meaning and representation is elastic” (Paglen 2016: para. 29).

With the growing importance of machine vision, however, the categories coined in the field of cultural and media studies, as well as the representational strategies developed by artists, become obsolete. To a great extent, this is due to the fact that, for machine vision, the elasticity of language and representation “ceases to exist” (Paglen 2016: para. 29). This applies to the specific case of algorithmic face recognition, where images are being made by and for machines and the human eye is being gradually replaced by an algorithmic gaze. In this context, concepts such as representation, meaning, spectacle, identification, mimesis, and misrecognition suddenly appear inadequate to explain the invisible new terrain where images exercise their power (Paglen 2016). Accordingly, “If we want to understand the invisible world of machine-machine visual culture, we need to unlearn how to see like humans. We need to learn how to see a parallel universe composed of activations, keypoints, eigenfaces, feature transforms, classifiers, training sets, and the like” (Paglen 2016: para. 20).

In Paglen’s (2016) assessment of the substitution of human vision for machine vision, a general shift in the notion of visual representation can be identified. This shift can be read, in Serge Daney’s (1999: 181) terms, as the passage from the age of the image to the age of the visual: “I call ‘image’ what still relies upon an experience of vision, and ‘visual’ the optical verification of a procedure of power.” The image is based on an experience of “alterity”: something is always missing in an image, which implies that the spectator has an active role in the completion of its meaning (Daney 1999: 182). This is what Paglen (2016) refers to as the “elasticity” that is essential to representation and that has underlined many of the theories explaining the political dimension of images until now. The visual, instead, contains all of the information necessary for the execution of a technical procedure. Machine vision thus belongs to the domain of the visual since it is not concerned with the ambiguity of meaning (mediation) but rather with the effectivity of its operations (performativity). Similarly, Ingrid Hoelzl (2018: 361) distinguishes between the hard-image and the soft-image. While the former refers to a “solid representation of a solid world,” the latter is part of a program “necessary to carry out an action” based on “the relation of data and of algorithms that are engaged in an operation” (Hoelzl 2018: 361).

Following a similar path to that of Paglen (2016) and Hoelzl (2018), Tobias Matzner (2016: 200) advocates for a performative approach to algorithmic technologies that overcomes a “representationalist account.” For Matzner (2016: 200), strategies that seek resistance by evading surveillance are an example of these representational accounts, which focus on the mediation between the image and the subject represented. Similarly, critics who focus on the inaccuracy of algorithmic data analysis and its “epistemic mistakes” continue to reproduce the representationalist perspective (Matzner 2016: 202). In both cases, algorithmic data are still conceived from the perspective of human interaction, that is, as incomplete and elastic mediations that need to be completed by a human spectator. As an alternative, Matzner (2016: 200) calls for a new approach that pays attention to the performativity of algorithms and shows “how data is used and how categorization takes place.” This involves examining how algorithmic technologies are being used, their effectivity, and the effects caused by their application.

When addressing the role of art practices in this new context, Paglen (2016: para. 30) claims that one way artists have been trying to challenge machine vision is by “creating forms of seeing that are legible to humans but illegible to machines.” An example of this is the work of artist Adam Harvey, who develops makeup schemes, hair designs, and accessories in order to prevent face recognition algorithms from connecting a face to a given individual.⁴ The problem with these strategies, Paglen (2016: para. 30) claims, is that, in the long run, algorithms will learn how to include even those adversarial images “designed to thwart automated

⁴ For a thorough and critical analysis of these practices of anti-surveillance camouflage, see Monahan (2015) and Kafer (2016).

recognition systems.” Following Matzner’s (2016) argument, it could be added that these forms of resistance based on evasion reproduce a representationalist account of algorithmic technologies. Alternatively, more effective strategies of resistance should come from new forms of artistic experimentation that force spectators to unlearn how to see like humans while teaching them how algorithmic vision is acting upon reality.

Three Examples of Critical Surveillance Art

Rafael Lozano-Hemmer’s *Level of Confidence* (2015), Heather Dewey-Hagborg’s *Probably Chelsea* (2017), and Trevor Paglen’s *Machine Readable Hito* (2017) are three pieces of critical surveillance art that explore how algorithmic technologies act upon reality while drawing attention to the antagonism between human and machine vision. The first of these works (Figure 1 and Figure 2) is “an art project featuring a face-recognition camera that has been trained with the faces of the 43 disappeared students from the Ayotzinapa school in Iguala, Mexico. As you stand in front of the camera, the system uses algorithms to find which student’s facial features look most like yours and gives a ‘level of confidence’ on how accurate the match is” (Lozano-Hemmer 2015: para. 1).

Standing in front of a vertical flat-screen connected to a camera and face-recognition software, the spectator becomes an integral part of the artwork. Without them, the artwork remains incomplete and is not activated. This means that the spectator is both the recipient of the work and a constitutive part of its “hardware.” The images of the forty-three students used in the piece, together with that of the spectator, resemble passport photos. This emphasises the theme of surveillance and identification (while using more familiar photos would have generated a more commemorative tone). The “level of confidence” displayed on the screen will never reach one hundred percent since the students (or their bodies) have not been found. Furthermore, it is significant to mention that the project’s software “is available for free download so that any university, cultural centre, gallery, or institution can set-up the piece” (Lozano-Hemmer 2015: para. 3). This could be read as a sign that this type of artwork grants greater importance to the software and its performativity than to its material support and formal characteristics.

Figure 1: Rafael Lozano-Hemmer, *Level of Confidence*, 2015. Image reprinted with the permission of the artist.

Facial recognition engine: Fisher, Eigen, LBPN **Detected similarity score:** 334.692 points
With the face of disappeared Ayotzinapa student: Alexander Mora Venancio
Level of confidence: 16 % **Result:**

Alexander
Mora Venancio

Figure 2: Rafael Lozano-Hemmer, Level of Confidence, 2015. Image reprinted with the permission of the artist.

The second work of art is *Probably Chelsea* (2017) by artist Heather Dewey-Hagborg (Figure 3 and Figure 4). This piece “consists of thirty different possible portraits of Chelsea E. Manning algorithmically generated by an analysis of her DNA” (Dewey-Hagborg 2017: 11).⁵ Its aim is to show not only that “genomic data can tell a multitude of different stories about who and what you are” but also “how many ways your DNA can be interpreted as data, and how subjective the act of reading DNA really is” (Dewey-Hagborg 2017: 11). The thirty portraits were printed using 3D technology and hung from the ceiling in the middle of the room at a range of human heights, allowing the spectators to walk around them. The different heights and the differences in the actual portraits create the effect of being in front of thirty different subjects, even if the audience knows that they were all generated from the same genetic source. According to Dewey-Hagborg (2017: 11): “the form of the installation was inspired by conversations Chelsea and I had about the limits of DNA profiling, along with the incredible mass movement that advocated for her release from prison. We have so much more in common genetically than difference. *Probably Chelsea* evokes a kind of DNA solidarity; on a molecular level we are all Chelsea E. Manning.”

Figure 3: Heather Dewey-Hagborg, *Probably Chelsea*, 2017. Image reprinted with the permission of the artist.

⁵ Chelsea E. Manning is an American ex-soldier who gained public notoriety for disclosing classified military documents to WikiLeaks in 2009. She was later sentenced and imprisoned. The day after the sentencing, Manning issued a statement that she was a transgender woman and that she would thus go through a gender transition process. In 2017, Chelsea Manning got her sentence commuted by President Barack Obama, reactivating the public debate around her.

Figure 4: Heather Dewey-Hagborg, *Probably Chelsea*, 2017. Image reprinted with the permission of the artist.

The third piece is Trevor Paglen's *Machine Readable Hito* (2016). In this work, Paglen presents 360 colour photographic portraits of artist and art theorist Hito Steyerl (Figure 5). The portraits are printed on adhesive paper and organised in forty-five columns and eight rows. Like the images in Lozano-Hemmer's work, Hito Steyerl's portraits resemble passport photos set against a white background and depicting the same outfit, reinforcing the idea of identification. In every portrait, however, she has a different facial gesture that defies the solemnity of surveillance practices. Beneath each portrait (Figure 6), a short metadata text indicates "the age, gender, emotional state and other signifiers that the [facial recognition] algorithms have interpreted from the images" (Paglen 2017: para. 9). For example, in a portrait in which Hito is closing her eyes and frowning, the algorithm suggests that the individual is 37.92% male, whereas in the next portrait, in which Hito neither frowns nor closes her eyes, the algorithm assigns her an 84.48% female identity (Figure 7).

Figure 5: Trevor Paglen, *Machine Readable Hito*, 2017. Image reprinted with the permission of the artist.

Figure 6: Trevor Paglen, Machine Readable Hito, 2017. Image reprinted with the permission of the artist.

Figure 7: Trevor Paglen, Machine Readable Hito, 2017. Image reprinted with the permission of the artist.

These three artworks are in tune with the ideas of both Paglen (2016) and Matzner (2016) since they explore the performative dimension of machine vision and algorithmic face recognition. They do so, however, by highlighting the tension between the domain of human vision and that of machinic vision. Put differently, by bringing images from the invisible domain of algorithmic processes to the visible domain of human vision, these artworks draw attention to a key antagonism between two modes of conceptualising the political dimension of representation. On one hand, images are understood as mediation between a human subject and the world. From this perspective, the elasticity of meaning becomes the key political territory where representations can naturalise meanings or challenge these naturalizations. On the other hand, visual information is understood as part of a larger technical procedure measured not in terms of mediation but rather in terms of its effectivity.

In *Machine Readable Hito*, for example, the ambivalences of gender identity are contrasted with the statistical calculation of gender assignation, creating a short circuit between human mediation and mathematical calculation. Like many recent pieces of algorithmic art, Paglen's work attempts to highlight the fact that machine learning is always dependent on the fixed social determinations contained in the images used for its training process. By using a large number of portraits of the same individual and showing the erratic outputs given by the algorithm, *Machine Readable Hito* challenges any unmediated relation between the face and a fixed identity. On the contrary, this work unveils to its human spectators that the machinic eye does not think in terms of identity, subjectivity, or representation, but in terms of statistical analysis and acceptable margins of error (Figure 8). This means that gender classification algorithms cannot be thought of in terms of objectivity, but must instead be conceptualised from the perspective of their effectivity. Whereas objectivity belongs to the representationalist realm of human mediation, effectivity belongs to the technical domain of performativity.

Figure 8: Trevor Paglen, *Machine Readable Hito*, 2017. Image reprinted with the permission of the artist.

Similarly, in *Probably Chelsea*, the technical process that generates a portrait out of genetic information is based on a process of machine learning. This process is determined by the training data set employed, directly affecting the outcome of the algorithm. Like in the previous example, “objectivity” (as the “bracketing off” of all prejudice) is a technical impossibility since the algorithm itself depends on a training process based on previous data. Instead, the algorithm’s performance can only be measured in terms of its technical effectivity. In this work, Dewey-Hagborg uses a technology known as “forensic DNA phenotyping” or “molecular photofitting,” which generates police face sketches based on forensic samples. According to Dewey-Hagborg (2015: para. 1), a “handful of scientists and companies around the world” are

not only trying to make this technology possible but also are trying to legitimate it as “a useful law enforcement tool.” By using this technology to create thirty different facial representations based on Chelsea Manning’s DNA, Dewey-Hagborg’s work develops a threefold critique of these surveillance technologies: first, it questions the objectivity of an algorithm that produces thirty different portraits based on the same DNA; second, it questions the impartiality and neutrality of genomic science that connects a given DNA to a given sex; and third, it challenges the unmediated relation between the face and an individual’s identity in a context in which objectivity and impartiality are being used to justify the use of this technology as a concrete law-enforcement mechanism.

Finally, Lozano-Hemmer’s *Level of Confidence* contrasts a representational approach (based on the objective link between the forty-three portraits and the forty-three disappeared students) and a performative approach (based on the statistical comparison between the forty-three portraits and the spectator). Just as Paglen’s *Machine Readable Hito* always fails to identify a photo of Hito Steyerl as being 100% female, *Level of Confidence* never achieves a perfect match between the spectator and any of the provided portraits. In both cases the algorithm provides an output in terms of “acceptable margins of error.” The promise of objective judgement (which serves as the basis for any judiciary use of representation) is thus replaced by the statistical calculation of an effective output. The human drama behind the forty-three missing students (expressed in the impossibility that this work will ever reach a level of confidence of 100%) is contrasted with the “non-human” calculation of acceptable margins of error.

In addition to rendering visible an antagonism between objectivity and effectivity, these three pieces of critical surveillance art draw attention to a key aspect of algorithmic face recognition technologies: a growing tension between the intensification of personalisation made possible by the technical power to individualise given subjects and the withering of the individual through processes that focus on pre-individual and supra-individual aspects of data. The critical dimension of these three artworks lies largely in their capacity to represent to the human eye this key tension that characterises contemporary power formations but that remains concealed in the invisible territory of machine vision.

Between the Individual and the Population

In his 1978 lecture, Michel Foucault (2009: 25) put forth the thesis that Western societies may no longer be dominated by disciplinary technologies of power but instead by what he called “mechanisms of security.” For Foucault (2009: 85), disciplinary institutions operate by implementing a norm and later applying this norm to every element in a given series (e.g., a series of workers, soldiers, etc.), thereby distinguishing between the “normal” elements that conform to the norm and the “abnormal” ones that do not. Instead, security apparatuses use statistical instruments in order to “think of the phenomena in terms of the calculus of probabilities” (Foucault 2009: 87). This means that, while discipline deals with the aleatory by imposing a given norm and hence normalising bodies and behaviours, security deals with the aleatory by means of identifying patterns and statistical curves and, therefore, predicting future events.

Both discipline and security are technologies of power that deal with multiplicities: in both cases, the political issue at stake is how to organise a given multiplicity (of humans, of productive powers, of natural events, of economic assets, etc.). Disciplines do so by setting a clear “objective or result to be obtained” and then by defining the ideal mode (the “norm”) to achieve this objective or result (Foucault 2009: 26). This becomes most evident in the relationship between the individual and the mass that characterises disciplinary societies. From a disciplinary perspective, the individual functions as the key object of power that allows for the organisation of the mass. Through the process of individualising each subject within the mass, discipline extracts from each element its maximum productive efficiency while decreasing to a minimum its political potential (Foucault 1995: 220–221). Apparatuses of security instead replace the population for the individual as its key object of power. A population is not simply a collection of individuals but a new entity “in which we can note constants and regularities even in accidents” (Foucault 2009: 104). Security apparatuses exercise power on a multiplicity by applying statistical calculations that can identify patterns and tendencies and hence bring “the most unfavourable in line with the most favourable” (Foucault 2009:

91). The art of exercising power on a population is defined by Foucault (2009: 110) as “the art of governmentality.”

Governing a population is like governing a ship: you do not impose a norm on what is given (e.g., the winds and currents) but, rather, you use this given in order to take the ship safely to its destination (Foucault 2009: 135). This means that you do not govern a population by simply imposing disciplinary norms on each of its elements but rather by identifying its (statistical) tendencies in order to channel them towards given predictable patterns. The art of governmentality, therefore, can be understood as the sum of analyses, calculations, and tactics “that allow the exercise of this very specific, albeit very complex, power that has the population as its target, political economy as its major form of knowledge, and apparatuses of security as its essential technical instrument” (Foucault 2009: 144).

Despite the fact that Michel Foucault (2009) forged the notion of governmentality to describe a specific logic of power discovered in the eighteenth century with the birth of political liberalism, some authors have used this notion in order to explain more recent phenomena linked with the emergence of information technologies.⁶ Most significantly, Antoinette Rouvroy and Thomas Berns (2013) have applied Foucault’s analysis of societies of security in order to argue that the rapid spread of information technologies is contributing to the emergence of an “algorithmic governmentality” where the “digital self” becomes a cog in a larger machine of big data and statistical predictability. What is at stake in this movement from discipline to algorithmic governmentality is a shift from the mechanisms of discipline that focus on the individual as a whole to mechanisms of “personalisation” in which algorithms are used to break down the individual into pieces of data and then to recompose these data in the form of populations (Hacon 2017: 239).

The rise of algorithmic technologies is causing a shift from the closed spaces of confinement (factory, school, prison, hospitals, etc.) to the open and virtual space of the network. In this new territory, the key characteristic is that of circulation: every aspect of digital technologies is designed in order to facilitate the rapid flow of all its elements (information, money, images, etc.). Furthermore, algorithmic technologies do not function by imposing given moulds but simply by identifying patterns (Steyerl 2017: 50). The fixed mould of disciplinary techniques is thus replaced by the shifting modulations of big data analyses. By doing so, algorithmic governmentality boosts the passage from the individual to the population as the main object of power. In this new context, algorithmic governmentality utilises computing power in order to accelerate a shift from individualisation (which places the subject at the centre of social relations) towards a different conceptual framework that focuses on both a smaller and a larger object of power. Unlike previous political rationalities, such as sovereignty and disciplines, algorithmic governance grasps the subjects “no longer through their physical body, nor through their moral conscience... but through multiple ‘profiles’ assigned to them, often automatically, based on digital traces of their existence and their everyday journeys” (Rouvroy and Berns 2013: 11–12). More specifically, this means that, thanks to the emergence of big data and machine-learning algorithms, information technologies have become efficient apparatuses of security that deal “on the one side with fragmented flows of data and on the other with huge aggregates, which only secondarily identify the subject on which to pin a hope (that they might be a consumer) or a fear (that they might be a terrorist)” (Wark 2017: 79).

According to Foucault (2009: 98), what is most interesting in the technologies of security from the eighteenth century is the fact that the notion of population is linked to an idea of “naturalness.” This means that patterns and curves of normality can be identified and predicted in a given population because there must be a certain natural basis to be unveiled. In claiming so, Foucault (2009: 100) adds, the apparatuses of security define nature as a new territory where the technologies of power extend their reach: nature not as a natural territory on which laws must be imposed but nature as something accessible to techniques of transformation by means of statistical calculation (Foucault 2009: 100). Following Foucault’s reflections on

⁶ This approach differs from previous tendencies to read information technologies from the perspective of disciplinary societies. Examples of this are Poster (1990), Gandy (1993), and Lyon (1994).

governmentality, the current success of algorithmic technologies can be read as an expansion of the eighteenth-century ideology of the “naturalness” to be found in populations. Through powerful algorithms and enormous amounts of data, current technologies of algorithmic governmentality unveil patterns and tendencies that would otherwise remain hidden. Moreover, these patterns and tendencies are presented today as some deep truth, that is, as a “natural essence” that stems spontaneously and unprompted from the free movements and actions of a population. As Rouvroy and Berns (2013: 9) put it, algorithms present “the possibility of a seemingly perfect ‘democratic’ normativity, devoid of any reference to general classes and categories.” In fact, they add, the idea that algorithms remain blind to “socially experienced categorizations (social, political, religious, ethnic, gendered, etc.) is the recurrent argument used by advocates of these algorithms replacing human evaluation” (Rouvroy and Berns 2013: 9). As mentioned above, however, the pretended neutrality of algorithmic technology stems from the confusion between objectivity and effectivity, which, in turn, depends on two different notions of algorithmic practices: a representationalist account that focuses on the epistemic relation between data and reality and a performative approach that draws attention to the large technical and social operations where this technology is inscribed. From the second perspective, the main political issue with algorithmic face recognition technologies is not whether they are representative but how they are operating as a concrete technology of power.

Politics of the Face

In an extensive study on the politics of the face, Jenny Edkins (2015: 3) has shown that “there is a connection between the significance attached to the face and particular concepts of the individual.” During the Renaissance, for example, portrait painting was used as a mechanism aimed at the individualisation of powerful subjects through the face (Edkins 2015: 2). In this context, portrait painting worked as a power mechanism in which the face was a sign of individuality. With the invention of photography, the representation of the face was “democratised,” widening the social process of individualisation (Edkins 2015: 2). This coincided not only with the birth of phrenology and physiognomy (Edkins 2015: 102–103) but also, and most importantly, with the reversal of the axis of individualisation as identified by Michel Foucault in *Discipline and Punish* (1995: 192).⁷ In the case of algorithmic face recognition, however, the face as a sign of individuality is confronted with the face as the result of statistical analysis. From this perspective, algorithmic face recognition connects a face to a given individual based only on the calculability of an acceptable margin of error. This implies that, unlike previous forms of facial representation such as portrait painting and portrait photography, the face in the age of algorithmic recognition is not a matter of individuality and subjectivity but a matter of pre- and supra-personal probabilistic calculations.

Nevertheless, the fact that algorithmic face recognition technology is being deployed as a security tool by governments and as a commercial tool by corporations means that the individualisation of subjects through their faces is still a key component of contemporary power (Cagle and Ozer 2018). From this perspective, the face is becoming a new “fingerprint” that authenticates a subject’s uniqueness (e.g., the latest smartphones and laptop computers can be unlocked through the face of their owners). This uniqueness, however, seems to contradict the general shift from the individual to a population that characterises algorithmic governmentality. On one hand, there is a noticeable increase in the application of face recognition algorithms as mechanisms of individualisation while, on the other hand, there is a tendency to use algorithms to move beyond the notion of the individual and to connect pre-individual fragments of data to the supra-individual statistical predictability of a population. In other words, if the individual as a key object of power is retracting within the context of algorithmic governmentality, how can we explain the growing importance of face recognition algorithms as a power apparatus within this context? According to

⁷ According to Michel Foucault (1995: 192), disciplinary societies represent a “reversal of the political axis of individualization.” Whereas pre-modern societies were defined by an “ascending” logic of individualisation (that is, where individualisation is greatest in those who exercise power), modern disciplinary societies can be defined by a “descending” logic of individualisation. In disciplinary societies, “as power becomes more anonymous and more functional, those on whom it is exercised tend to be more strongly individualized” (Foucault 1995: 193).

Rouvroy and Berns 2013: 12), this contradiction reflects the ambivalences of algorithmic governmentality in regards to the question of individuality:

Our era is often considered as that of the victory of the individual, in the sense that an individualization of services is observed, due to the possibility afforded by statistical practices to closely target the needs and dangers specific to each individual. At the same time, it is also seen as an era in which individuals are jeopardized, as their intimacy, privacy, autonomy, and self-determination are threatened by those very practices.

One way of addressing these ambivalences is to understand the current process through which algorithms connect a given statistical analysis to a specific person not in the traditional sense of individualisation but rather as personalisation (Rouvroy and Berns 2013: 12). Personalisation, Rouvroy and Berns (2013: 13) claim, “resembles more of a hyper-segmentation and hyper-plasticity of commercial offers than comprehensive consideration of the needs and desires specific to each person.” From this perspective, algorithmic face recognition should not be understood as a technology that individualises a unique subject through his or her face but rather as a mechanism that personalises pieces of information based on statistical calculation. This difference implies that regardless of an individual’s “capacity for understanding, willpower and expression, algorithmic governmentality approaches him or her no longer on the basis of these capacities, but rather on that of their ‘profiles’ (as a potential fraudster, a consumer, a potential terrorist, a student with high potential, etc.)” (Rouvroy and Berns 2013: 12). Analogously, the face no longer appears as a sign of a unique subjectivity but as an abstract template, that is, as one of the many aspects of a given profile.

The three case studies chosen in this article explore the ambivalences of personalisation at stake in algorithmic face recognition. More specifically, *Probably Chelsea* contrasts the shared belief in “uniqueness” commonly associated with genetic information with the aleatory portraits produced by algorithmic DNA phenotyping. On one hand, this technology is being proposed by police and justice departments as an instrument to link a given DNA to a specific facial identity (Dewey-Hagborg 2015). On the other, this identity has to be read not as authenticity and uniqueness but as the result of statistical analysis based on a training process that uses thousands or even millions of portraits. Similarly, *Machine Readable Hito* denounces the ideology behind facial analysis algorithms by showing that the assigned gender or emotion is not an “authentic” or “innate” characteristic of the analysed face but an average template extracted from the pattern analysis of portraits belonging to thousands of people. Finally, in *Level of Confidence*, the individualising ability of face recognition algorithms (which should link each portrait with the identity of each missing student) is contrasted with a performative dimension in which individualisation is only the result of an average calculation that dissociates the portrait of the missing student from a raw and unmediated individuality. In all three works, a core tension can be recognised between identity as a power mechanism used to identify an individual within a multiplicity and identity as the result of a match between elements similar enough to be measured.⁸

Algorithmic Interpellation

Finally, these three examples draw attention to the issue of resistance. From the perspective of Rouvroy and Berns (2013: 10), algorithmic governmentality “produces no subjectification, it circumvents and avoids reflexive human subjects, feeding on infra-individual data which are meaningless on their own, to build supra-individual models of behaviours or profiles without ever involving the individual, and without ever asking them to themselves describe what they are or what they could become.” This means that, ultimately, algorithmic face recognition is “interested in neither the subject nor individuals” (Rouvroy and Berns 2013: 27). From this perspective, resistance has to be detached from the notion of emancipation. In modern political thought, emancipation is traditionally linked to the question of subjectivity. Concepts such as

⁸ For a thorough analysis of this contradiction, see Goriunova (2019) and Celis (2019).

representation, autonomy, self-determination, recognition, etc., presuppose a process of subjectification that renders the subject as an autonomous and self-conscious being. According to Rouvroy and Berns (2013: 12) in the case of the new power relations that stem from algorithmic governmentality, the question of resistance can no longer presuppose the emancipation of a self-determined subject.

Unlike Rouvroy and Berns (2013), Matzner (2016: 205) argues that algorithmic technologies still operate through the interpellation of a subject and hence resistance should not be detached so quickly from emancipation.⁹ Algorithmic interpellation, however, does not need to be understood in terms of the representationalist domain of ideology, but rather as performativity. Matzner (2016: 206) draws on Rita Raley's (2013) notion of "data performativity" in order to argue that algorithmic technologies produce subjects through a process of interpellation in which the subject does not pre-exist a power relation but is produced by it. Algorithmic face recognition, for example, operates not by linking a facial template to a pre-existing subject. Instead, this technology produces subjects by a process of interpellation that connects a given statistical calculation to a certain individual body. In the specific case of algorithmic surveillance, Matzner (2016: 206–207) explains:

the interpellative side of the performativity of data becomes salient. The recombining, relating, and moving to different contexts of data, which happens in data-based surveillance, does not primarily mean a problematic distancing from an originary subject. To the contrary, this process assembles the authority to produce a new subject – in the case of surveillance by "calling" it a subject.... Somebody who is stopped at a border, denied a visa, or excluded from boarding a plane based on Big Data becomes a subject for the respective authorities in the very moment these verdicts happen.

From the perspective defended by Matzner (2016), resistance and emancipation must be redefined through the lens of performativity. Since there is no "self-identical subject," resistance cannot be thought of as subtracting oneself from interpellation, but rather as looking for alternative ways in which "performativity yields different ways of subjectivity" (Matzner 2016: 208). Hence, acts of "counterveillance" should not be aimed for by opting out of surveillance systems (as in the case of artist Adam Harvey), but by overloading the system and experimenting with it (Raley 2013: 130).

Probably Chelsea, *Level of Confidence*, and *Machine Readable Hito* constitute three strategies of "counterveillance" that redefine the notions of resistance and emancipation beyond the idea of a self-identical subject. In the first case, Dewey-Hagborg's piece does not aim to safeguard some sort of pre-technical individuality against the machinic impetus of algorithmic technologies. Instead, *Probably Chelsea* defines a notion of individuality that is itself technically and socially mediated and that, as such, is always produced by specific power relations. *Probably Chelsea* is not looking for Chelsea Manning's "authentic self." Its thirty different portraits are instead highlighting the fact that identity cannot be separated from the technological devices that define it or from the power relations that shape it. Emancipation and resistance are not a matter of deeper truth but of subjective and technological experimentation. Similarly, Lozano-Hemmer's *Level of Confidence* challenges the distinction between face and identity in an age of algorithmic face recognition. When this technology produces a "match," it is always based on a statistical calculation that tries to reduce the margin of error to a minimum. This margin of error, however, does not depend on a direct, non-mediated, relation between the facial image and the subject's identity, but rather on a training process that employs photos from many other individuals. In the hands of police departments and security agencies, this mediation disappears behind the illusion of an "identity match." In the hands of Lozano-Hemmer, this technology reveals that every process of identification is always a process of oblivion that conceals the mediated and statistical nature of surveillance technologies. Furthermore, *Level of Confidence* interpellates its spectators by showing the percentage of them that belongs to one of the missing students. This sends two powerful messages: "any of us could have been one of those students" and "there is a part of us in each one of them." Finally, *Machine Readable Hito* develops a strategy of resistance that highlights

⁹ For a deeper analysis of the interpellative function of algorithms, see Monahan (2018) and Flisfeder (2018).

the mathematics behind gender assignment and emotion analysis. What are thought of as an individual's most innate characteristics appear in this work as the result of statistical analysis. The fact that Hito's "female percentage" depends on her facial expression—which in turn depends on a training data set—speaks of a world in which power technologies are no longer aiming at the discovery of a "deeper truth" but in which subjects are being produced in the very moment when an algorithmic judgement takes place (Matzner 2016: 202).

The search for a unique and authentic self is no longer a possibility for political resistance. Critical surveillance artworks must instead produce strategies capable of experimenting with new forms of interpellation that generate new forms of subjectivity. As Monahan (2018: 575) puts it, by revealing the rationalities behind surveillance systems and "pushing people to question their places within the systems," critical surveillance art can create "a space for ideological critique." The best way of doing so is by "nurturing ambiguity" (Monahan 2018: 575). This ambiguity, however, should not be understood at the level of meaning, but rather at the level of the artworks' performative dimension: "by fostering ambiguity and decentering the viewing subject, critical surveillance art can capitalise on the anxiety of viewers to motivate questions that might lead to greater awareness of surveillance systems, protocols and power dynamics" (Monahan 2018: 576). *Probably Chelsea*, *Machine Readable Hito*, and *Level of Confidence* are three significant pieces of critical artwork that nurture ambiguity regarding a twofold tension: that between representation and performativity in the context of machine vision and that between the individual and the population in the context of algorithmic governmentality. None of these artworks attempt to solve this twofold tension. Instead, they attempt remain in it as a strategy of political resistance and subjective experimentation.

Acknowledgments

This article was supported by CONICYT (Chile) under the grant Fondecyt N°11170065.

References

- Agüera, Blaise, Alexander Todorov, and Margaret Mitchell. 2017. Physiognomy's New Clothes. *Medium*, May 7. <https://medium.com/@blaisea/physiognomys-new-clothes-f2d4b59fdd6a> [accessed December 12, 2019].
- Beller, Jonathan. 2018. *The Message is Murder: Substrates of Computational Capital*. London: Pluto Press.
- Berger, John. 1972. *Ways of Seeing*. London: Penguin Books.
- Brighenti, Andrea Mubi. 2010. Artveillance: At the Crossroad of Art and Surveillance. *Surveillance & Society* 7 (2): 137–148.
- Buolamwini, Joy, and Timnit Gebru. 2018. Gender Shades: Intersectional Accuracy Disparities in Commercial Gender Classification. Paper presented at the *Conference on Fairness, Accountability and Transparency*, New York, February 24–24. <http://proceedings.mlr.press/v81/buolamwini18a/buolamwini18a.pdf> [accessed December 12, 2019].
- Cagle, Matt, and Nicole Ozer. 2018. Amazon Teams Up With Law Enforcement to Deploy Dangerous New Face Recognition Technology. ACLU of Northern California, May 22. <https://www.aclunc.org/blog/amazon-teams-law-enforcement-deploy-dangerous-new-face-recognition-technology> [accessed December 12, 2019].
- Cahill, Susan. 2015. The Art & Surveillance Project. www.artandsurveillance.com [accessed December 12, 2019].
- . 2019. Visual Art, Corporeal Economies, and the "New Normal" of Surveillant Policing in the War on Terror. *Surveillance & Society* 17 (3/4): 352–366.
- Celis Bueno, Claudio. 2019. The Face Revisited: Using Deleuze and Guattari to Explore the Politics of Algorithmic Face Recognition. *Theory, Culture & Society* 37 (1): 73–91.
- Daney, Serge. 1999. Before and After the Image. *Discourse* 21 (1): 181–190.
- Deleuze, Gilles. 1995. *Negotiations 1972-1990*. New York: Columbia University Press.
- Dewey-Hagborg, Heather. 2015. Sci-Fi Crime Drama with a Strong Black Lead. *The New Inquiry*. <https://thenewinquiry.com/sci-fi-crime-drama-with-a-strong-black-lead/> [accessed December 12, 2019].
- . 2017. *A Becoming Resemblance*. New York: Fridman Gallery.
- Edkins, Jenny. 2015. *Face Politics*. New York: Routledge.
- Eubanks, Virginia. 2018. *Automating Inequality: How High-Tech Tools Profile, Police, and Punish the Poor*. New York: St. Martin's Press.
- Flisfeder, Matthew. 2018. The Ideological Algorithmic Apparatus: Subjection Before Enslavement. *Theory & Event* 21 (2): 457–484.
- Foucault, Michel. 1995. *Discipline & Punish: The Birth of the Prison*. New York: Knopf Doubleday Publishing Group.
- . 2009. *Security, Territory, Population: Lectures at the Collège de France 1977-1978*. London: Palgrave Macmillan.
- Gandy, Oscar H. 1993. *The Panoptic Sort: A Political Economy of Personal Information*. Boulder, CO: Westview Press.

- Gates, Kelly. 2011. *Our Biometric Future: Facial Recognition Technology and the Culture of Surveillance*. New York: New York University Press.
- Goriunova, Olga. 2019. Face Abstraction! Biometric Identities and Authentic Subjectivities in the Truth Practices of Data. *Subjectivity* 12 (1): 12–26.
- Hacon, Christopher. 2017. The Algorithmic Subject: The Neo-Liberal Apparatus and the Social Media Technology of Power.” PhD diss., University of Otago.
- Hoelzl, Ingrid. 2018. Postimage. In *Posthuman Glossary*, edited by Rosi Braidotti and Maria Hlavajova, 361–362. London: Bloomsbury.
- Kafer, Gary. 2016. Reimagining Resistance: Performing Transparency and Anonymity in Surveillance Art. *Surveillance & Society* 14 (2): 227–239.
- Lozano-Hemmer, Rafael. 2015. Level of Confidence. http://www.lozano-hemmer.com/level_of_confidence.php [accessed December 12, 2019].
- Lyon, David. 1994. *The Electronic Eye: The Rise of Surveillance Society*. Minneapolis, MN: University of Minnesota Press.
- Matzner, Tobias. 2016. Beyond Data as Representation: The Performativity of Big Data in Surveillance. *Surveillance & Society* 12 (2): 197–210.
- Monahan, Torin. 2015. The Right to Hide? Anti-Surveillance Camouflage and the Aestheticization of Resistance. *Communication and Critical/Cultural Studies* 12 (2): 159–178.
- . 2018. Ways of Being Seen: Surveillance Art and the Interpellation of Viewing Subjects. *Cultural Studies* 32 (4): 560–581.
- Montero, Valentina, and Pedro Donoso. 2014. Dissent and Utopia: Rethinking Art and Technology in Latin America. *Leonardo* 20 (1): 136–147.
- Paglen, Trevor. 2016. Invisible Images (Your Pictures Are Looking at You). *The New Inquiry*, December 6. <https://thenewinquiry.com/invisible-images-your-pictures-are-looking-at-you/> [accessed December 12, 2019].
- . 2017. A Study of Invisible Images (Press Release). Metro Pictures. <https://www.metropictures.com/exhibitions/trevor-paglen4/press-release> [accessed December 12, 2019].
- Poster, Mark. 1990. *The Mode of Information: Poststructuralism and Social Context*. Cambridge, UK: Polity Press.
- Raley, Rita. 2013. Dataveillance and Countervailance. In *Raw Data is an Oxymoron*, edited by Lisa Gitelman, 121–145. Cambridge, MA: The MIT Press.
- Rouvroy, Antoinette, and Thomas Berns. 2013. Algorithmic Governmentality and the Prospects of Emancipation. *Reseaux* 177 (1): 163–196.
- Steyerl, Hito. 2017. A Sea of Data: Apophenia and Pattern (Mis)Recognition. In *Duty Free Art: Arte in the Age of Planetary Civil War*, 47–61. London: Verso.
- Virilio, Paul. 1994. *The Vision Machine*. Indianapolis, IN: Indiana University Press.
- Wark, McKenzie. 2017. Maurizio Lazzarato: Machinic Enslavement. In *General Intellects: Twenty-One Thinkers for the Twenty-First Century*, edited by McKenzie Wark, 77–92. London: Verso.
- Zarsky, Tal. 2011. Governmental Data Mining and its Alternatives. *Penn State Law Review* 116 (2): 285–330.