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Seeing Double: Machine Vision, Difference, and Repetition

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In thinking about human and machine vision in relation to doppelgangers, I turn to Francois Brunelle's photographic project "I'm not a look-alike." Here the artist captured people that were not related yet looked very similar. This uncanny resemblance was attributed to shared DNA. Brunelle's lengthy quest for finding our doppelganger is part of a larger existential question about one's uniqueness and thus individuality. A quest that is now seen as being attainable in a quick and efficient manner by algorithms that can compare millions of DNA codes. As an article from the New York Times from 2022 suggests, rendered through machine vision, a saliva swab now can reveal and verify not just our ancestry but also our real-world living doubles. In the popular imaginary, machine vision can also uncover based on DNA analysis our true soulmate. This is indeed the premise of Netflix's original series The One. While these accounts are oriented towards a future, machine vision is already deployed in facial recognition surveillance practices in which it aims to identify and verify unique individuals that can be continuously monitored. In the context of surveillance, visual resemblance can have serious personal consequences. The look-alike is thus both desired and feared. Adam Harvey's project MegaPixels takes on this dualistic function of the double by exposing the presence of doppelgangers on Flickr, where Flickr was used extensively for the establishment of training data sets. Taking on a Deleuzian framework of difference and repetition, this project explores perceptions of machine vision in the shaping media of verification in popular culture, artistic, as well as surveillance contexts.

Keywords: algorithmic culture, verification, platform seeing, distributed verification, distributed identity

This project explores the role of algorithmic technology in establishing individual identity through visual detection and categorization of physical differences. It focuses on the ways in which AI has been harnessed to discern individuality and provide a framework of verification that supposedly surpasses human vision. I trace the processes of discrediting the power of human observation by focusing on notions of doubling, of look-alikes, of soulmates, and twins. I investigate physical as well as data doubles of individuals as well as entire data selves and even data sets. More specifically, I evoke the work of Francois Brunelle and his "I am not a look-alike" project where real people who looked like each other were photographed together. Whereas Brunelle's project tackles physical doubles, the critical work by Adam Harvey titled *MegaPixels* engages with the doubling of the self in relation to image-based data sets. Here participants were reunited with their digital selves as articulated by Flickr based data sets. Whereas physical doubling is often seen as jarring, spiritual or romantic doubling is often seen as equally elusive yet desirable. I take on the idea of romantic 'matching' done by dating algorithms based on physical traits. More specifically, I look at DNA matching in both real and fictional contexts. In thinking about doubling in relation to resemblance and distinction I evoke Deleuze's framework of repetition and difference in order to explore the role of algorithmic technology as a media of verification. Further, I situate these processes in the historical trajectory of visuality-based discriminatory state-surveillance as detailed by Allan Sekula. With the emergence of algorithms as media of verification, vision has been displaced into what Adrian MacKenzie and Anna Munster have called "platform seeing."[1] In an algorithmic culture, identifying look-alike doppelgangers, seeing doubles, or seeing in general are no longer associated with traditional forms of visuality but rather increasingly rooted in the technologically articulated 'invisual.'

The idea of the existence of another "you" has been an enduring motif in Western mythology. The notion of the doppelganger comes from the German literary tradition, and the writing of Jean Paul, in particular. It signals what Andrew Webber has called a "visual double bind," where literary and conceptually, the term has come to mean "people who have seen themselves."[2] In this doubling, the seen subject is perceived to be the double, the one that is repeating an original. This notion of doubling has been connected to notions of selfhood – as Webber points out, the "process of enactment of identity always mediated by the other self" can be disrupting to the notion of selfhood.[3] Double vision thus challenges the notion that a visual

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[1] Adrian MacKenzie and Anna Munster, "Platform Seeing: Image Ensembles and Their Invisualities," Theory, Culture & Society 36 no.5 (June 3, 2019).

[2] Andrew Webber, *The Doppelgänger: Double Visions in German Literature* (Oxford UK: Oxford University Press, 1996), 3.

[3] Ibid.

encounter with the familiar appearance of the self reconfirms identity formation by reenacting a Lacanian "mirror stage." When this doubling shows a visually similar yet different self, the notion of identity itself becomes challenged. Doppelgangers have thus traditionally been associated with negative connotations, with evil spirits, parodies, distortions, and excess. While visual doubles have been cast historically in a negative light, spiritual doubles have been elevated as two parts of a whole – think soulmates and twin flames, etc. In the realm of romance, finding your other half has remained a persistent mantra. Recently, algorithmic technology has been harnessed in helping identify our doppelgangers, our doubles in both realms – both the physical and the romantic. With it, has continued to maintain these two lines of thought of danger and desire in relation to double vision. Physical look-alikes have been treated as a suspect to the unique identity formation that modernity has come to rely on, while romantic look-alikes have continued to be valorized as a guarantee for the longevity of a potential nuclear family unit. A smile for the camera coupled with a saliva swap processed by algorithmic technology can now supposedly identify your data self, your look-alikes, your personality traits, as well as your true soulmate. Those distinctions rely on the establishment of patterns of difference as well as repetition and their truthful detection via technological means.

In thinking through the relationship between difference and repetition in relation to the concept of the doppelganger, I turn to Deleuze's seminal text *Difference and Repetition*. For Deleuze, repetition and generality are quite different. Generality evokes resemblances and equivalences: "[g]enerality represents two major orders: the qualitative order of resemblances and the quantitative order of equivalences...generality expresses a point of view according to which one term may be exchanged or substituted for another."[4] In other words, in the context of generality, one thing resembles another qualitatively, and can be replaced or substituted by its other. Repetition, for Deleuze, precludes replacement:

> repetition as a conduct and as a point of view concerns non-exchangeable and non-substitutable singularities. Reflections, echoes, doubles and souls do not belong to the domain of resemblance or equivalence; and it is no more possible to exchange one's soul than it is to substitute real twins for one another.[5]

Further, repetition signals the "universality of the singular" and is moreover hypothetical structure rather than a common structure – an exception and

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[4] Gilles Deleuze, *Difference and Repetition*, trans. Paul Patton (New York: Columbia University Press, 1994), 1.

[5] Ibid., 15.

transgression rather than a norm.[6] In recognizing an event as repeating, one might first and foremost recognize the singularity of the past and current event, hence gain the ability to differentiate between both, but also to collapse this difference in order to acknowledge the ways in which both events become indistinguishable. To repeat a look, uniqueness must be established as a prime principle of organization. Repetition thus evokes universality and singularity, whereas generality relies on particularity and variation.

Establishing resemblance versus repetition when encountering a double – be it physical, digital, or spiritual is at the core of truth verification assemblages. Think of arriving at an airport where your face is compared to the image of your face on your identification documents. Two faces that can either be confirmed as a singular event, hence repetition of the singular identity, or confirmed as variations hence as evidence of the existence of two separate physical entities that resemble each other. The expected doubling here is one of repetition in which the image and the physical self are singular. The suspect one would be a resemblance of the image to two particulars that share common features as well as a degree of difference manifest in turn as a variation.

Historically, central to the notion of doubling and identification have been processes of verification of one's identity. It requires a match between what is presented and what is known. Verification, in relation to the body, has historically been connected to unique identification and complex classification. It attempts to answer the question "Who are you?"[7] Late 19th century identification was equated with verification as exemplified in Craig Richardson's study of the US Passport.[8] Here, verification was to anchor identity as part of modern surveillance systems. It is important to note that verification implies an act of "seeing" by state and corporate agents. The notion of encountering a doppelganger becomes displaced from being an interpersonal visual double-bind to one in which the observation and verification are enacted through state-based technological surveillance. Verification aims to dispel that double bind by aiming to re-anchor individual identity back to unique selves and thus establish the difference between resemblance and repetition.

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[6] Ibid., 15.

[7] Michel Foucault, *The Birth of Biopolitics*, ed. by Michel Senellart, trans. Graham Burchell (New York: Palgrave Macmillan, 2008), 34.

[8] Craig Robertson, "The Archive, Discplinarity, and Governing: Cultural Studies and the Writing of History." *Cultural Studies<->Critical* Methodologies 4 no.4 (2004): 454. And Craig Robertson, "A Documentary Regime of Verification: The Emergence of the US passport and the archival problematization of identity. *Cultural Studies<->Critical Methodologies* 23, no.3 (2009): 331.

In a sense, verification is the process of confirming that the query and the established item are the same for the sake of state security. Verification is always and already coupled with its opposite – hence falsification. Think back to this process of matching the face of a traveler to the photograph on their travel document. This match is always susceptible of being not entirely a repetition of the query but rather of being resemblance. The falseness projected by resemblance evokes the idea of the doppelganger. A doppelganger refers precisely to that scenario, of being like another, yet never the same, yet this time in the eyes of the state. It is in a doppelganger that a degree of difference as variation is always maintained. Therefore, the aim of verification is to identify differences and then to either eliminate them – hence confirm repetition or reaffirm them with confidence – hence deny it and signal resemblance. The doppelganger threatens to hide an existing difference and thus provide a false confirmation threatening the validity and authority of surveillance verification platforms. It does so by emerging as a prime instance of falsification obscured by resemblance.

The question of verification has historically been grounded in visual assessment of difference and repetition. 19th century methods of verification relied on anthropometric principles that coupled photography to a basic set of facial measurements in the search for a perfect match between archived data and newly recorded data. Anthropometrics reduces the human body to mathematical data that was to buttress visual observations. Alan Sekula has historicized this connection and linked it to the emergence of the criminal and the deviant in 1846.[9] (13). In determining the criminal body, photography defined the "normal" body based on the institution of a photographic archive. Sekula argued that is insufficient to "describe the emergence of a truth-apparatus" only as a function of the "optical model provided by the camera."[10] Rather, he proposed that "[t]he camera is integrated into a larger ensemble: a bureaucratic-clerical-statistic system of 'intelligence'", a system that "can be described as a sophisticated form of the archive" with its central artifact "not the camera but the filing cabinet."[11] As Sekula illustrated, Bertillon's system of policing as well as Galton's anthropometric eugenic human classification systems depended on both photography and data.

With the emergence of digital technology, biometrics – the automated recognition of individuals based on measurable biological (anatomical and physiological) and behavioral characteristics – anchored verification in the realm of probability. Digital technology "[has transformed] the body into a digital media

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[9] Allan Sekula, "The Body and the Archive," *October* (Winter 1986): 13.
[10] Ibid., 17.
[11] Ibid., 16.

object" to be accessed through computer algorithms.[12] This transformation has allowed for complex probability calculations where probability is now explicitly linked to notions of certainty or confidence. Biometrics further reconfigured verification as not a process of "primary visual relation" to its subjects but rather as "dataveillance" – "a mode of ordering information" – without relying on the act of seeing the body as being of primary importance.[13] Indeed, biometrics insists on the fallibility of the human eye to detect a doppelganger. It is the data body, rather than the individual body as invested in a cultural and historical context, that is of interest. As a digital media object, "the individual is doubled as code, as information, or as simulation"[14] effectively transforming them into a Deleuzian 'dividual.' For Deleuze, "[i]ndividuals have become '*dividuals*,' and masses, samples, data, markets, or '*banks.*'"[15] They are further subjected to *dataveillance.*

The work of Adam Harvey precisely exposes this flattening. As a data activist and artist, Harvey has critiqued data sets, data banks by exposing their origins. His 2017 project *MegaPixels* allowed visitors to find their doppelganger data selves.[16] Here facial recognition capture of an audience member was run against the world's biggest facial recognition data set called MegaFace (V2), which is in turn encompassed Flickr's large image collection. The participant then was able to see images that the algorithms identified as a match, seeing photographs of themselves and their doppelgangers. Once a match between the audience face and the 627,000 identities was detected, a printed-out summary could be generated, reflecting the confidence score for this match. In 2021, Harvey in collaboration with Jules LaPlace released the *Exposing.ai* project which allows users to see if their *Flickr* photographs have been used in facial recognition datasets used for biometric surveillance research.[17]

Historically, attempts to legitimize verification processes rooted in either visual or algorithmic methods, have led to the coupling of observation data to DNA data. In their book *Truth Machine: The Contentious History of DNA Fingerprinting*, Lynch, Cole, McNally and Jordan trace the history of DNA testing and the paradigmatic shifts that it introduced in creating a new truth regime. They highlight the 1980s as the moment in which DNA identification was introduced in criminal forensics and

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[12] Lisa Nakamura, "The Socioalgorithmics of Race: Sorting it out in Jihad Worlds in *The New Media of Surveillance*, eds. Shoshana Magnet and Kelly Gates (London and New York: Routledge, 2009), 153-4.

[13] Bart Simon, "The Return of Panopticism: Supervision, Subjection, and the New Surveillance" *Surveillance and Society* 3, no. 1(2005): 15.

[14] Gilles Deleuze, "Postscript on the Societies of Control," *October* 59 (1992): 5.

[15] Ibid.

[16] Adam Harvey, *Megapixels: Glassroom.* https://adam.harvey.studio/megapixels-glassroom/.

[17] Adam Harvey and Jules LaPlace, Exposing AI. http://www.exposing.ai.

the 1990s as the period in which this form of verification came to be perceived as more trustworthy and truthful than fingerprinting. As noted in the book, Bertillon's system of measurement and fingerprinting had already provided a displacement way from photography's power of truthful identification.[18] Obtaining measurements from faces and fingers thus functioned as one major paradigm of identification. On the other hand, DNA, a sequence of molecular genetic code, provided an alternative framework for offering a unique demarcation for each individual. The DNA paradigm of truth verification emerged out of a collaboration between the geneticist Alex Jeffreys and English investigators of a teen murder in 1985. Jeffreys introduced the idea of a genetic fingerprint which worked by providing unique Variable Number Tandem Repeats (VNTRs) whose length varies from one individual to another. These measurements were then aggregated and compared in order to produce a system reliant not on an exact match but rather on "probabilistic claims."[19] This notion of probability is central here as it renders the process of verification in alignment with the algorithmic logics of probabilistic prediction. AI processes resemble and amplify identification techniques associated with DNA data – they create an AI equivalent of DNA, a digital DNA of sorts, and at the same time adopt and adapt notions of probability and forecasting.

In the 1980s and 90s, individuals thus doubled as code, to go back to Deleuze's observation both as a set of facial and finger encoded measurements as well as genetic code. It is the former rather than the ladder then that algorithmic measurements have come to augment and appropriate. This complex history of physical measurements and genetic sequencing in criminal investigations sheds light on the contemporary coupling of AI identification and DNA in the formation of truth regimes. As Michael Van Creveld has argued, "[b]y definition, training is a future-oriented activity, and one cannot train without having at least a rough idea as to what one is training for. In other words, what the future may be like."[20] The forecasted future is a doppelganger of a familiar model—it aims to repeat the past and therefore it notes the distinction between the past and the present moments. It fails to acknowledge and further hides this distinction, parading as sameness rather than likeness. Predictive models promise repetition, reproduction, and replication. Further, as Wendy Chun has argued in her book *Discriminating Data*, these forecasts emerge the desired repetition of a selected

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[18] Michael Lynch, Simon Cole, Ruth McNally and Kathleen Jordan, *Truth Machine: The Contentious History of DNA Fingerprinting*, (Chicago: The University of Chicago Press, 2008), 8.

[19] Simon Cole, *Suspect Identities: a history of criminal identification and fingerprinting* (Cambridge, MA Harvard University Press, 2001): 290.

[20] Michael Van Creveld, *Seeing into the Future: A Short History of Prediction* (London: Reaction Books, 2020), 211.

past—the repetition of an outcome in time.[21] AI systems extend forecasting yet at the same time look to gain legitimacy by recourse to both technology and human biology.

By coupling AI with DNA matching, truth regimes of identification transition to complementary paradigms that are both founded on notions of probability rather than verified repetition of the biological markers of a unique person. The move towards a regime of verification being built on notions of probability signals a blurring of the lines between Deleuze's resemblance and repetition. Here, the distinction between singularity and variation could be positioned as part of a spectrum. The articulation of both repetition and resemblance to probability has led to the further technological elaboration of verification apparatuses. In other words, the move to probability has resulted in further instances of technocratic-based legitimacy of the methods used to assert false and true matches. As we move from human observation to DNA sequencing and machine learning, the hidden probability calculations appear valid because of the science or technology that deliver the verdicts. As the process of verification get displaced away from the human eye, technocratic platforms appear to hide their own probabilistic framework to appear to be better judges of who is a doppelganger and who is a true equivalency.

It is the visual equivocation of doppelgangers, or people should exhibit Deleuzian repetition and yet in comparative sorting systems appear to be in the order of resemblance, that threatens to sabotage regimes of verification. The existence of physical doppelgangers is the subject of Francois Brunelle's art project "I'm Not A Look-Alike." Brunelle photographed people who looked like each other and were yet unrelated. For Brunelle' "a look-alike (double, doppelganger)" is "someone who looks like another person to the point that there is confusion about them."[22] The project did not intend to bring a critical lens around the issue, but rather presented a series of curious encounters. These visual matches were done by the photographer based on photographic submissions collected through his website. In other words, it is the photographer that identified people who looked alike to him. The photographs, according to NPR Reporter Serri Graslie, give "new meaning to the phrase 'double exposure.'"[23] Here notions of origin and copy, repetition, and difference, come into play in relation to documentary photography. The photographic image is seen as evidence of the existence of likeness in the context of human individuality and uniqueness. The double exposure, a mechanical process in which photographs are

[21] Wendy Hui Kyong Chun, *Discriminating Data* (Cambridge, MA: The MIT Press, 2021).

[22] Francois Brunelle, "I'm not a look-alike," http://www.francoisbrunelle.com/webn/e-project.html.

[23] Serri Graslie, "Have We Met Before? Dopplegangers Caught on Camera" NPR (January 19, 2013) https://www.npr.org/sections/pictureshow/2013/02/04/170279625/have-we-met-before-doppelgangers-caught-on-camera.

superimposed and merged into one image, is used as a metaphor for the ability of photography to capture, to document and reveal nature's own duplication processes. The exposure here is of the existence of people who look alike which can run counter to ideas of neoliberal individualism. The medium of photography, and the genre of portraiture in particular, provided the platform for verification of these uncanny resemblances. Brunelle's images are striking precisely because they are seen as evidence, as carriers of both truthful human exitance as well as pointers to a greater social truth. They are part of the larger photographic documentary tradition that saw its mission the exposure of the innerworkings of our social and natural worlds.

Brunelle's project complicates the notion of visual doubling. His subjects are photographed together, often in similar outfits. What is notable here is that their faces and poses are often similar and fall within the portraiture genre conventions. Heads tilted together at three-fourth of a view, showing slight left or right profile. Faces, lined up to be compared without the stylistic arrangements adding to their difference. And yet, neither one is a copy, both are original. Hence, the title of the project – NOT a look-alike. Brunelle's pointed rejection of the concept of the look-alike speaks to the inherent pairing of authentic-inauthentic binary and emphasizes the uniqueness of people.

The uncanny resemblance captured in his work subsequently inspired several scientific studies attempting to provide an explanation by classifying and comparing human data. One study explored the psychological and genetic makeup of non-related look-alikes in relation to twins. Here the photographic resemblance was seen as a jumping point for further investigation into the "real" similarities or differences between these individuals. In other words, photography was seen a as means of documenting an oddity and not as a means of verifying the reasons for these resemblances. Brunelle's project was reworked into a psychological research study, carried out by Nancy L. Segal, who specializes in Twin studies. Segal wanted to find out if personal traits are linked to physical appearance or to DNA: "I reasoned that if personality resides in the face," she said, "then unrelated look-alikes should be as similar in behavior as identical twins reared apart. Alternatively, if personality traits are influenced by genetic factors, then unrelated look-alikes should show negligible personality similarity."[24] It is important to reiterate that this idea of "personality residing in the face" is part of a larger history that coupled photography and physiognomy.

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[24] Segal cited in David Levine, "Holding a Mirror to Their Natures," *The New York Times*, August 25, 2014, https://www.nytimes.com/2014/08/26/science/looking-at-twin-personality-through-look-alikes.html.

The truth-value of photography has thus been historically reliant on a system of linked data. In the case of Segal's study, the photographic value was linked to physiological and DNA data respectively to infer their personality traits. Segal's study showed that these unrelated look-alikes did not have similar personalities and therefore reaffirmed her stance on linking personality similarities to similar genetic makeup. In a sense, photography coupled with systems of knowledge, was seen as being able to show the "hidden mirror" of our nature.[25] Photography here emerges as an instance of technology that can augment and supersede human vision. Whereas a Lacanian mirror stage depends on human observation, here another hidden mirror becomes accessible and foundational for the articulation of the self. This time it is a technological mirror that is still rooted in human vision, this time mediated by photography. This mirror, however, could be deceiving – photographs showing physical likeness proved to be a false lead in finding personality similarities. Further, the photographic apparatus emerged as a platform of verification when coupled with studies of the universal unit of genetic makeup known as DNA.

A more recent study carried out by Manel Estellar and his team, explored photographically documented similarities in relation to shared DNA. This 2022 study also used Brunelle's project as a starting point. It asked 32 pairs documented in it to take DNA tests and lifestyle questionnaires.[26] Here facial recognition algorithms were brought in to distinguish the "real" look-alikes. According to AI, half of the pairs shared visual likeness scores similar to those of actual twins. These sixteen pairs were then deemed as authentic doppelgangers and their DNA was further examined. The other sixteen were seen as false doppelgangers – verified by photography yet rejected by machine learning. Estellar's study found that "16 pairs who were "true" look-alikes shared significantly more of their genes than the other 16 pairs that the software deemed less similar."[27] Artificial intelligence here emerged as a more reliable platform of verification. It was perceived as a more reliable system of detecting facial similarities and therefore of shared DNA than photography itself. The photographic system by itself was yet again seen as deceptive. The "true" doppelganger status was confirmed to be the result of shared DNA and could now be detected by AI-driven facial recognition. With the proliferation of facial recognition technology, the underlying premise is that we all have doppelgangers with whom we share DNA and AI can help us find them. Estellar's study circled back to criminology, echoing the 19th-century work of Bertillion and Galton, as he again linked "facial features to behavioral

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[25] Levine, "Holding a Mirror to Their Natures."

[26] Kate Golembiewski and François Brunelle, "Your Doppelgänger Is Out There and You Probably Share DNA With Them," *The New York Times*, August 23, 2022, https://www.nytimes.com/2022/08/23/science/doppelgangers-twins-dna.html.

[27] Ibid.

patterns" and argued that his "study's findings might one day aid forensic science by providing a glimpse of the faces of criminal suspects known only from DNA samples."[28]

Digging deeper into Estellar's study helped identify the different facial recognition systems that supported the argument that AI is a more truthful platform for verification. The team that he was part of used three methods: the custom deep convolutional neural network *Custom-Net*,[29] the *MatConvNet* algorithm, and the *Microsoft Oxford Project face API*[30] (STAR Methods).[31]

AI systems were also used to process the DNA data collected via saliva samples. Based on the DNA analysis, nine of the sixteen look-alikes were deemed as "'ultra' look-alike."[32] AI was deployed to analyze both facial traits and DNA data for likeness. Via questionnaire data, the DNA and facial trait likeness were also liked to behavior. As the study suggests, "humans with a similar face might also share a more comprehensive physical, and probably behavioral, phenotype that relates to their shared genetic variants."[33] I want to pause here and point to the importance of situating such studies in a larger historical context filled with racial and gender bias. The assumptions made in this study stem out of the problematic coupling of photography with phrenology and physiognomy as illustrated by Alan Sekula's work.[34] Sekula warned about the doubling of photography as both an honorific and repressive system. Sekula has argued that from its inception photography was a "double system: a system of representation capable of functioning both honorifically and repressively."[35] Photography itself functioned as a system of doubling – one in which the photographic portrait found its social negative look alike in the police archive. Portraiture became harnessed as a way of documenting the bourgeois self, manifested in the passport photo, as well as the criminal self, as illustrated by the mug shot. These two formats of representation share similar stylistic characteristics in framing the subject. Passport photographs and mugshots operate as social doppelgangers. One

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[28] Ibid.

[29] herta security. "World Leaders In Facial Recognition | Herta." Accessed August 23, 2023. https://hertasecurity.com/.

[30] "Azure AI Vision with OCR and AI | Microsoft Azure." Accessed October 23, 2023. https://azure.microsoft.com/en-us/products/ai-services/ai-vision.

[31] Joshi, R. et. al. "Look-alike humans identified by facial recognition algorithms show genetic similarities." CellReports. Vol 40. Issue 8. 111257. (August 23, 2022). https://doi.org/10.1016/j.celrep.2022.111257.

[32] Ibid.

[33] Ibid.

[34] Alan Sekula, "The Body and the Archive."

[35] Ibid., 6.

being the "good" twin and the other the "bad." Yet, in the eyes of facial recognition, these two formats are indistinguishable. As Joshi et. al.'s study points out, "modern face verification algorithms have recently achieved near-perfect accuracy, as high as 99.97% on NIST's Facial Recognition Vendor Test,[36] for passport photo or mugshot scenarios."[37] Here, their social difference is erased in favor of formulaic similarities that lie beneath the surface. In showing the "hidden" facial recognition systems are obscuring the obvious. To return to photography and portraiture, it is important to note that Brunelle's photographs were conceived as portraits, speaking to our likeness as social beings. As art objects, his images were curated in a book and displayed as part of exhibits as part of a visual narrative. In the doubling of photography as art and science, as honorific and repressive, as deceitful and truthful, it is important to bear in mind its historical trajectory, visual context, and social meaning. The danger of algorithmic truth-regimes anchored in visual culture is that they flatten social, cultural, and historical complexity. The danger of this new emergent regime of truth is the erasure of the messing doubling that visuality is always and already endowed with.

Machine learning algorithms are also being applied to DNA databases in favor of finding a well-intended romantic match. Your DNA can also be run through an algorithm in order to determine one's true match. The app and website *DNARomance.com* promises such an outcome: "DNA Romance is an online dating site that forecasts romantic chemistry between people using DNA markers that play a role in human attraction."[38] The Huston-based dating startup *Pheramor* also has made claims that it can harness our DNA for matchmaking purposes.[39] This idea stems from research carried out on mice in the 1970s and is now being revived under the technological lens of machine learning and the biological framework of immunology.[40] While such projects are met with skepticism, algorithmically deciphered DNA as a predictor of romantic love has become the subject of numerous fictional accounts including *Amazon's* series *Soulmates*, *Netflix's Osmosis*, and *Black Mirror's* episode on

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[36] "Face Recognition Technology Evaluation (FRTE) 1:1 Verification." Accessed August 23, 2023. https://pages.nist.gov/frvt/html/frvt11.html#overview.

[37] Joshi, R. et. al. "Look-alike humans identified by facial recognition algorithms show genetic similarities."

[38] DNA Romance. http://www.DNARomance.com.

[39] Megan Molteni, "With This DNA Dating App, You Swab, the Swipe for Love." *Wired.com* (February 28, 2018). https://www.wired.com/story/with-this-dna-dating-app-you-swab-then-swipe-for-love/.

[40] Jackie Mansky, "The Dubious Science of Genetics-Based Dating." *Smithsonian Magazine* (February 14, 2018). https://www.smithsonianmag.com/science-nature/dubious-science-genetics-based-dating-180968151/.

"Hang the DJ."[41] Notable here is Netflix's original series *The One* (2021). Here, a stolen DNA biomedical database leads to the creation of an algorithm that can find one's perfect mate based on a DNA match. In this British sci-fi drama, algorithms become the true matchmakers. A mouth swab leads not to confirming a physical doppelganger, but rather a true love match. The story goes that

> [o]ne simple mouth swab is all it takes. A quick DNA test to find your perfect partner, the one you're genetically made for. A decade after scientists discovered everyone has a gene they share with just one other person, millions have taken the test, desperate to find true love. Now, five more people meet their Match. But even soul mates have secrets. And some are more shocking and deadlier than others.[42]

The story was written by Howard Overman and is based on a novel by John Marrs.[43] In these series, techno-determinism takes on "genetically destined partners" and the dissolution of untrue partnerships, partnerships that are not validated by the algorithmic match.[44] True match, in this fictional account, is rooted in our DNA and thus cannot be seen or determined by the human heart. "A single strand of hair [is] all it takes to be matched with the one person that you are genetically guaranteed to fall in love with."[45] In this fictional account, the algorithms get the matches right. While the biomedical database in *The One* is illegally harnessed as the fuel for the matchmaking startup, in the real world, the dating app *Pheramor* is using a "large cancer large cancer registry because the same genes *Pheramor* looks at can be used to

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[41] Lucy Mangan, "Soulmates review – what if Amazon could recommend your one true love?" *The Guardian* (February 8, 2021). https://www.theguardian.com/tv-and-radio/2021/feb/08/soulmates-review-what-if-amazon-could-recommend-your-one-true-love.

[42] "The One," *IMDB.com*, https://www.imdb.com/title/tt13879466/.

[43] Lucy Mangan. "The One review – algorithm-themed thriller is TV by numbers," *The Guardian* (March 12, 2021). https://www.theguardian.com/tv-and-radio/2021/mar/12/the-one-review-netflix-review.

[44] Brian Lowry, "'The One' ranks second among dramas about finding love through DNA," CNN.com (March 11, 2021). https://www.cnn.com/2021/03/11/entertainment/the-one-review/index.html.

[45] Sheena Scott, "'The One' On Netflix: Complex British Sci-Fi That Does More Than Search for Soulmates," Forbes.com (March 13, 2021). https://www.forbes.com/sites/sheenascott/2021/03/13/the-one-on-netflix-complex-british-sci-fi-that-does-more-than-search-for-soulmates/?sh=3af514e31d29

determine whether someone can be a stem cell donor for people with leukemia, lymphoma, and sickle cell disease."[46]

With the advancement of algorithmic technology, the processes of verification both in the context of surveillance and matchmaking have become distributed platform events. The field of platform studies provides a useful theoretical framework for understanding the distributed nature of verification that algorithmic technology facilitates. Social media platforms have become an integral part of the social and political fabric of our society as they often function as both "mediators" and "brokers" of information.[47] As such, they are often seen as engaging with individual users in producing "creator communities."[48] Further, digital and algorithmic platforms have come to articulate new forms of publics through connected action.[49] The notion of the platform extends beyond social media into thinking about technological landscapes that span beyond traditional notions of media. In thinking about verification as a distributed platform process, I am extending the discourse on platforms beyond media into the realm of mediated technology to highlight the intersection, the nexus between what constitutes media and what constitutes technology.

Visually, algorithmic technologies have produced what Adrian MacKenzie and Anna Munster have called "platform seeing."[50] Here, verification could be seen as the result of a new mode of observation that is "invisual"[51] The double bind encounter with the doppelganger is now displaced into state-machine invisual assemblages. The machine learning systems that structure algorithmic platforms, reduce seeing to the detection edges, contrast, and "recognizable compositional elements at immerse scale and mobility."[52] Further, as MacKenzie and Munster aptly point out, "observation becomes (a) distributed event."[53] Both the image, and its data are now part of distributed generic banks, sets to be marketed, sold, sampled regardless of the socio-cultural origin of the visual or even of the initial data contexts. In other words,

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[46] "Pheramor claims rights to sell user data from DNA dating site." Privacy International. (February 28, 2018). https://privacyinternational.org/examples/1988/pheramor-claims-right-sell-user-data-dna-dating-site.

[47] Tarleton Gillespie, "The politics of 'platforms'" *New Media and Society*, 12 no 2 (February 9, 2010). https://doi.org/10.1177/1461444809342738.

[48] Jean Burgess, Creator Culture, (New York: New York University Press, 2021).

[49] Mark Carrigan and Lambros Fatsis, *The Public and their Platforms: Public Sociology in an Era of Social Media*, (Bristol, Bristol University Press. 2021).

[50] MacKenzie, and Munster, "Platform Seeing: Image Ensembles and Their Invisualities."https://doi.org/10.1177/0263276419847508.

[51] Ibid., 7.

[52] Ibid., 9.

[53] Ibid.

platform seeing distributes a now equivocal observation result, situated outside of socio-historical context.

As MacKenzie and Muster further point out, in the context of algorithmic technology, "seeing is performed by a multitude of human and computational agents whose 'vision' passes across and along platforms, eluding any singular coordinated position, and heterogeneously conjoining things and practices."[54] This flow across platforms also erases any contextual singularity within the amasses artifacts as well as between the uses of the data sets. In a platform seeing landscape, a dataset of *Flickr*, or *OKCupid* images could be doubled as a data set for government surveillance or advertisement. Dating apps have been at the center of privacy debates as the intimate data they collect has been resold and repackaged into generic data sets. 70,000 dating profiles from the dating website *OKCupid* ended up in a dataset posted on the Open Science Framework.[55] In its real-world, adaptation algorithmic DNA based matchmaking has also raised privacy concerns about sharing DNA data. Pheramor, the algorithmic DNA matchmaking website, has claimed the right to sell user data as it itself uses cancer research data for its matching.[56] This doubling is hidden through the erasure of difference – data sets are seen as universally identical and thus applicable across domains. Cancer research data sets look like romantic matching data sets, dating data sets look like government surveillance data sets. In the creation of big image data sets, cultural meaning is stripped away. These sets are articulated as "training" grounds for algorithmic technology and often contain images taken from social networks, dating websites, and surveillance cameras, as well as the world wide web more broadly, often without the explicit consent of the people behind the faces.

Here, establishing the relationship of a doppelganger and further proceeding to verify their identical transposition, or their movement across, is the central task. In other words, when observing the landscape of data movement, the task of activists and ethicists has been to identify the presence of the same data set in two different data banks. This process has required the insertion of difference into a notion of a singular, universal big data. The difference has been anchored back into a socio-historical context. Algorithmic platforms of verification have themselves obscured their cultural, social, and historical differences in other to emerge as a generic distribution system. In other words, it is in claiming platform status, that this technology flattens and erases difference.

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[54] Ibid.

[55] "Researchers release a dataset of 70,000 users' OKCupid profiles and call the data 'public,'" Privacy International (May 12, 2016). https://privacyinternational.org/examples/1857/researchers-release-dataset-70000-users-okcupid-profiles-and-call-data-public.

[56] "Pheramor claims rights to sell user data from DNA dating site."

In the context of algorithmic culture, seeing is becoming increasingly a platform act linked to an emerging distributive identity. This process has been amplified by the extension of DNA and biometric doubles into data doubles on hand and by the introduction of machine vision on the other. These new distributive identities are in a way constructed by and used in justifying the use of algorithmic platforms of verification that operate in service of state and corporate agents. What is at stake in these reconfigurations is the displacement of both agency and trust as seeing, in general has, become act radically displaced from the realm of human subjectivity and situated in increasingly technological assemblages.

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