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Inter/Facing between Technology and the Face: Analyzing the CV Dazzle New Media Art

Project as a Techno-Social Critique of Present-Day Face Politics.

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## Table of Contents

Abstract	3
1. Destroying and Dismantling the Face	4
2. Inter/facing between Technology and the Face	10
2.1. Onto-epistemology and the Face	10
2.2. Face Politics	12
<i>1.2.1. The Face as a Marker of Individuality</i>	13
<i>1.2.2. The Face as a Marker of Mass Individuation</i>	14
2.3. The Face and Technology	15
3. Facing the Anti-Face	22
3.1. The Anti-Face: Form and Aesthetics	23
<i>3.1.1. Analysis: CV Dazzle Look 1</i>	23
3.2. The Anti-Face: Use and Functionality	26
<i>3.2.1. Documentations and Commentary Text</i>	28
<i>3.2.2. Basics of Python</i>	31
<i>3.2.3. Analysis: Code.</i>	32
<i>3.2.4. Visualization of the code</i>	34
4. Where Past and Present Collides	37
4.1. Artistic Properties	37
4.2. Functional Properties	39
4.3. A Message of Crisis?	40
5. The future of the face?	43
6. Bibliography	47

## Abstract

Today, our faces are processed, and new images of faces are produced by technology with almost no human intervention. These images of the face are powerful, as the face and visuality tells us something about the society that produces it. But how can we discuss onto-epistemological assumptions and the social ramification of this face when it is black-boxed? Over the past few years, a growing number of artists have also critiqued and interacted with the ubiquity of these facial recognition technologies through new media art. The phenomena shed light on the current understanding of the face, face politics, and the onto-epistemological status of the face concerning this technological landscape. This research looks at the past and present representation of the face and where it collides, unveiling a message of crisis from a hermeneutic and cultural perspective. The research focuses on the case study *CV Dazzle anti-face* (2010-ongoing) by new media artist Adam Harvey. The analysis consists of two parts combining two methods: formal analysis and critical code reading. The first part focuses on the artistic properties of the CV Dazzle anti-face and the second part on the functional properties in relation to the code it is interfacing with. The combination of these two reveals how CV Dazzle is interfacing with the technology and how this reflects a socio-technical critique showing that our onto-epistemological assumptions of the face are based on human perception from the past and that we need a new way of looking and understanding the face in this invisible technological realm. CV Dazzle is exemplary of how new media art can make tangible this invisible realm where faces are flowing through space and times in tiny fractions and therefore be a catalysator of this debate.

**Keywords:** CV Dazzle, Face Politics, Facial Recognition Technologies, Art History, New Media Art, Visuality, Visibility, Critical Code Reading, Interfacing.

## 1. Destroying and Dismantling the Face

“The face has a great future, but only if it is destroyed, dismantled.”<sup>1</sup>

The face can be understood as a surface that allows us to read each other’s emotions, moods, and personalities. The face seems to demand to be read by both computers and humans, and therefore hiding one’s face can be taken as “deviant” behavior. The ways of “seeing the face” and the representational practice of the face are not universally the same. Instead, Kelly Gates states that “any system for representing the face tells us something about the society and historical moment that produce it”.<sup>2</sup> Throughout history, the face’s significance is continuously acknowledged, in times of visibility but also in moments of suppression.<sup>3</sup> Therefore, both the faces produced by computer vision technologies and the anti-face practices against those technologies should be placed in the context of the “long history of representational practices of the face”, as Gates argues. She further elaborates that, “both the roles these technologies perform and the forms they take can only be adequately understood in relationship to that history”.<sup>4</sup> In line with Gates and according to Monahan, the creative and social practices of anti-surveillance against facial recognition technologies, in general, also need to be situated within their larger systems of meaning and control or within their visual economies.<sup>5</sup> Welchman argues that the face is “the primary site of visual representation, and has shaped the very conditions of visibility.”<sup>6</sup> According to Bal, visibility

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<sup>1</sup> Gilles, Deleuze and Félix Guattari, *A Thousand Plateaus: Capitalism and Schizophrenia*. (Minneapolis: University of Minnesota Press, 1987), 171.

<sup>2</sup> Kelly Gates, *Our biometric future: Facial recognition technology and the culture of surveillance* (New York: NYU Press, 2011), 193.

<sup>3</sup> John Welchman, “Face(t)s:Notes on faciality,” *Artforum*, 27, no.3 (November 1998): 131, <https://www.artforum.com/print/198809/face-t-s-notes-on-faciality-34670>.

<sup>4</sup> Gates, *Our biometric future*, 193.

<sup>5</sup> Torin Monahan, “The right to hide? Anti-surveillance camouflage and the aestheticization of resistance.” *Communication and Critical/Cultural Studies* 12, no. 2 (2015): 162, <https://doi.org/10.1080/14791420.2015.1006646>.

<sup>6</sup> Welchman, “Face(t)s, 131

is about “what is made visible, who sees what, how seeing, knowing and power are interrelated”.<sup>7</sup> Followed by Mirzoeff, who argues that visibility and visibility are also about political struggle, and the right to look and to be seen as citizens.<sup>8</sup> The other side of the coin of visibility is what Monahan describes as the “right to hide”, questioning who has the right to hide their faces for the technological eye.<sup>9</sup>

This means that we need to understand the face as a specific product, a product of *the abstract machine of faciality*<sup>10</sup>, which organizes and codifies faces (and bodies) to produce images of “normalization”.<sup>11</sup> These produced images of the face are inherently political, with a specific form and function. However, now in the era of algorithmic facial recognition technologies, these images of the face are invisible, black-boxed in a machine that can produce images of the face that are machine-readable without a human subject. Presented as subjective, these invisible images of the face have an impact on social order, as the face is a mode of governance, creating vertical realities. The face is constantly redefined in favor of modes of governance throughout the history of art and technology. It is an assemblage with its appearance, disappearance, and reappearance in its different forms and uses, aesthetics, and functionality. Following Welchman, “we find it [the face] one of the places in representation where the past and the present collide most powerfully, and continually exchange a message of crisis.”<sup>12</sup> But how can this message of crisis be unraveled when the present faces produced by computer vision technology are invisible and blackboxed? Art and technology are interwoven. Both are forms of expressions with specific structures and rules. Both tells us

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<sup>7</sup> Mieke Bal, “Visual essentialism and the object of visual culture.” *Journal of visual culture* 2, no. 1 (2003): 19. <https://doi.org/10.1177/147041290300200101>.

<sup>8</sup> Mirzoeff, Nicholas, “The right to look,” *Critical Inquiry* 37, no. 3 (2011): 474, <https://doi.org/10.1086/659354>

<sup>9</sup> Monahan, “The right to hide?,” 162.

<sup>10</sup> Deleuze and Guattari, *A Thousand Plateaus*, 167.

<sup>11</sup> Maira C García, “Deleuze’s Politics of Faciality: Trump and American Exclusion,” in *Trump and Political Philosophy: Patriotism, Cosmopolitanism, and Civic Virtue*, eds. Marc Benjamin Sable and Angel Jaramillo Torres (Cham, Switzerland: Palgrave Macmillan, 2018), 334.

<sup>12</sup> Welchman, face(t)s, 131.

something about society. Both represent and produce specific faces in form and function. Therefore, the aim of this research is to understand and question the role and representation of the face in new media art and technology from a cultural perspective. The research focuses on unraveling embedded ideologies that are not visible at first, found in this “message of crisis,” doing so by examining Adam Harvey’s CV Dazzle media art project also known as the anti-face. In this research I will show how the past and present of the face collides in the CV Dazzle anti-face, and how this interacts, where there is friction and what this tells us about the current understanding and the future of the face.

The CV Dazzle project (2010 – ongoing) developed by artist Adam Harvey is an example of an artistic form of facial artifices, which are tricks or ingenuity strategies to subvert the process of facial recognition which leverages different modes of governance. Adam Harvey develops artistic tactics of interfacing (finding a common language, mediation between entities)<sup>13</sup> with the facial recognition technologies, through artful ways of defacing (obstructing facial accessibility) and re-facing (changing facial appearance)<sup>14</sup>. His new media art project revolves around the creation of the anti-face<sup>15</sup> which can be adapted by individuals interacting with facial recognition technologies. See figure 1 below.<sup>16</sup>

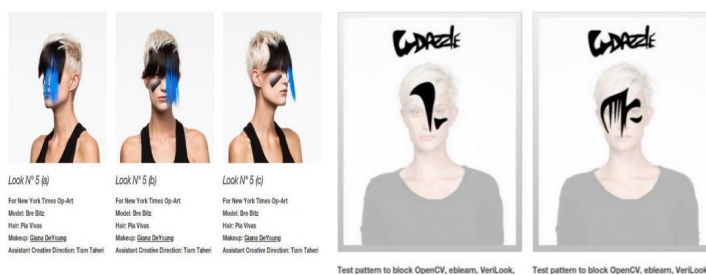


Figure 1. CV Dazzle Test Patterns for Stylists and Lookbook 2010-present.

<sup>13</sup> Michiel, De Lange, Sigrid Merx, and Nanna Verhoeff, “Urban Interfaces: Between Object, Concept, and Cultural Practice,” *Introduction to Urban Interfaces: Media, Art and Performance in Public Spaces*, eds. Verhoeff, et al. *Leonardo Electronic Almanac* 22, no. 4 (March 15, 2019): 9.

<sup>14</sup> Gavin JD Smith, “The politics of algorithmic governance in the black box city,” *Big Data & Society* 7, no.2 (July 2020), 5, <https://doi.org/10.1177/2053951720933989>.

<sup>15</sup> Adam Harvey, “CV Dazzle: Computer Vision Dazzle Camouflage,” Accessed on June 15, 2021. <https://cvdazzle.com/>.

<sup>16</sup> Figure 1: CV Dazzle Test Paterns and Lookbook 2010-present, *CV Dazzle by Adam Harvey*. Retrieved from <https://cvdazzle.com/>.

This form of interfacing, of finding a common language between technologies and the face, tells us something about the very meaning of the face that is being produced by algorithmic facial recognition technologies. Because the face is not a universal entity, but an assemblage co-produced both by technologies and the art project, the face (in its form and use) is inherently political. The CV Dazzle anti-face practices question the onto-epistemology<sup>17</sup> and the politics/power of the face in a present-day society, characterized by the impulses to know, capture, and categorize faces. Therefore, in this thesis, I ask: How is Adam Harvey's CV Dazzle anti-face media art project an example of a techno-social critique of present-day face politics?

The media art project as techno-social critique makes tangible the "invisible" ways how algorithmic facial recognition technologies shape the onto-epistemology and politics of the face. My goal is to investigate the role of the CV Dazzle anti-face in eliciting critical discussion about the matter by taking a hermeneutics perspective and combining both formal analysis (focusing on the artistic properties) and critical code reading (focusing on the functional properties). This unveils not only how the CV Dazzle anti-face interacts with algorithmic facial recognition technologies, but also the political, cultural, and social implications it has on the politics and onto-epistemology of the face, by considering both discursive and material properties, as well functionality and aesthetics. Therefore, the following sub-questions will be answered through the analysis of the CV Dazzle anti-face by asking: How do the artistic and formal properties reflect certain ideological assumptions about the face? How does the CV dazzle anti-face interface with the technology (code)? And how does the CV Dazzle anti-face art project critique and make tangible the ways algorithmic

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<sup>17</sup> Onto-epistemology of the face is understood as what the nature of the face in present-day society characterized by algorithmic facial recognition technologies is, and how it is made knowable to others, and becoming a source of specific information about people.

facial recognition technologies shape the onto-epistemology of the face, and the politics around the face? By answering these questions, I hope to demonstrate the objectives of my research which include: exploring the concept of face politics and visibility, highlighting the power relation between the face and technology, questioning the present-day face politics and the onto-epistemology of the face through CV Dazzle anti-face, and propose a more relational approach towards facial recognition technologies and the role of media art in present-day debate.

In this research, I am interested in how media art can help to generate critical perspectives and discussion about the changing onto-epistemological status (what is the nature of the face, how is it made knowable through technology and media art) and the face politics (how are power relations produced by facial recognition technologies) in an age of pervasive algorithmic facial surveillance and processing. As mentioned before, Gates argues that any system representing the face tells us something about the society and the historical moment that produces it, as any force that shapes human representational and visual practices shape our way of understanding the world and our places within it.<sup>18</sup> If the face is political, then, maybe we should imagine what difference it would make if we considered the face not as something universal and natural. Not simply existing, but as something that was made – similarly to how we discuss algorithms within the field of humanities. Therefore, CV Dazzle also tells us something about what it means to be in a society where these technologies are actively governing the liberties, we have by capturing and governing our faces and producing new faces. Through combined methods of formal analysis and critical code reading, my academic position is to propose a more relational approach toward facial recognition technology and rethinking present-day face politics through critical new media art projects.

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<sup>18</sup> Kelly Gates, *Our biometric future*, 193-194.



Through the analysis, the social relevance is established by approaching new media art and facial recognition technology with a more holistic and relational understanding, while also further discussing the implications of present-day face politics. The academic relevance of this research project for the field of new media studies is the focus on the very meaning of the face through the analysis of the new media art project CV Dazzle anti-face, thereby adding to the growing body of research on facial recognition technologies and surveillance studies.<sup>19</sup> Instead of only focusing on the object (technology) or anti-surveillance as a practice, the goal of this research is to focus both on material and discursive elements. By combining both formal analysis and critical code reading I focus on the interaction, the interfacing of CV Dazzle anti-face and technology.

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<sup>19</sup> David Lyon, Kevin Haggerty & Kirstie Ball, eds., *Routledge handbook of surveillance studies* (London: Routledge, 2012).

## 2. Inter/facing between Technology and the Face

To discuss how technologies, shape the onto-epistemology and the politics around the face, we need to understand what the assumptions of the face entails and how faces are produced, as well as explain the historical shifts in the very meaning of the face in order to understand the present-day face politics. This is done from a Western-centric perspective, as the case study also follows this path. Firstly, I will discuss the history of the representational practices of the face and discuss the social and political dimension of the different renderings of the face and questioning onto-epistemology of the face. Additionally, I will discuss the current situation of the face, followed by the discussion and theories on how the practices and technologies concerning the face are shaping our discourses, social and creative practices, social order, and vision of the future.

### 2.1 Onto-epistemology and the Face

In the book, *A Thousand Plateaus*, in chapter Year Zero Deleuze, and Guattari discuss the question of the face, its ontological genesis, and the role of the face producing subjects. They describe the face as a white wall with black holes, the product of the intersection of two regimes of the sign, the signifying and subjectifying sign. “Significance is never without a white wall upon which it inscribes its signs and redundancies. Subjectification is never without a black hole in which it lodges its consciousness, passion, and redundancies.”<sup>20</sup> Following Deleuze and Guattari the black hole-white wall system is, to begin with, not yet a face, but it is the abstract machine of faciality that produces concrete “normative” faces

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<sup>20</sup> Deleuze and Guattari, *A Thousand Plateaus*, 167.

according to “the changeable combinations of its cogwheel”<sup>21</sup>. Facialization is therefore the process of the imposition of a face on a body, like a landscape on a world. This imposition has social and political implications.

The concept of the abstract machine of faciality is a metaphor that helps me to analyze and understand the onto-epistemology of the face and question the face politics behind it.

Onto-epistemology is the understanding of being and knowing, in which there is no difference between subject and object, matter and discourse.<sup>22</sup> In my case study, I reflect on the onto-epistemology of the face, questioning the very nature of the face in the present-day face culture which is characterized by algorithmic facial recognition technologies, and how the face is made knowable to others through technology and media art. In the context of present-day society characterized by technologies trying to capture and produce faces, onto-epistemology is at stake in the politics around (local) knowledge – face politics. Following Barad, the relation between the material and the discursive is one of mutual entailment, as matter and meaning are mutually articulated.<sup>23</sup> This means that the very meaning of the face is materialized in some form and in specific times and places in order to exist.

To analyze the CV Dazzle media art project as a form of techno-social commentary on the onto-epistemology and politics of the face in an era of persuasive algorithmic facial technologies, I will now discuss the general shifts of the very meaning of the face in the history of western society.

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<sup>21</sup> Deleuze and Guattari, *A Thousand Plateaus*, 168.

<sup>22</sup> Barad, K. “Posthumanist performativity: toward an understanding of how matter comes to matter.” *Signs: Journal of Women in Culture and Society*, 28, no. 3 (2003): 829. 10.1086/345321.

<sup>23</sup> Barad, K. “Posthumanist performativity,” 822.

## 2.2 Face Politics

Following Deleuze and Guattari, Jenny Edkins constructed a complete analysis of what she calls face politics by exploring the face, questioning what exactly makes the face, what dismantles the face, and what politics these different representations of the reflects. While the face has always been the primary site of visual representation, it was Christianity that introduced the idea of a universal face, a *faces totius universi*. Christianity invented the “facialization” of the entire body, embodied in Jesus Christ, and spread it everywhere.<sup>24</sup> “The face of Christ appears both as a sign of his individuality (his human existence) and a sign of his universality (his sacred existence).”<sup>25</sup> According to Bueno, this face is shaped in time modern western societies, in which the face “has become sign of the individual unique individuality (singular) as well as a sign of their humanity (universal).”<sup>26</sup> According to Deleuze en Guattari, the spread of facialization also offers a way to understand racism. “Racism operates by the determination of degrees of deviance to the White man’s face, which endeavors to integrate nonconforming traits into increasingly eccentric and backward waves, sometimes tolerating them at a given place under given conditions, in a ghetto, or sometimes erasing them from the wall, which never abides alterity.”<sup>27</sup> Claudio Celis Bueno describes the passage from Christianity to modern western societies as a process of secularization in which every individual, just like Christ, obtains a face to become an individual.<sup>28</sup> Therefore, the face is a marker of individuality.

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<sup>24</sup> Deleuze and Guattari, *A Thousand Plateaus*, 176.

<sup>25</sup> Claudio Celis Bueno, “The Face Revisited: Using Deleuze and Guattari to Explore the Politics of Algorithmic Face Recognition,” *Theory, Culture & Society* 37, no.1 (2020): 77, DOI: 10.1177/0263276419867752.

<sup>26</sup> Bueno, “The face Revisited,” 77.

<sup>27</sup> Deleuze and Guattari, *A Thousand Plateaus*, 178.

<sup>28</sup> Bueno, “The Face Revisited,” 77.

### 1.2.1 *The Face as a Marker of Individuality*

Traced back to the Renaissance and Enlightenment periods, the portrait paintings worked as a representational system and power mechanism that produced the face as an apparatus of individualization reserved for those in power.<sup>29</sup> According to Edkins, this produced the idea of the individual - or the individual propertied male - as the building block of European political organization.<sup>30</sup> The face was a marker of singularity and personality within individuality itself, made knowable through art technologies. The produced images of the face were reserved for those in power (and were seen as “universal”) while the Others who did not have a face were part of the “faceless “masses.

Onwards, the notion of the individual became one of the key terms to define modernity in both the realms of politics and aesthetics. This was characterized by the antagonistic individual/masses pair, characterized by Baudelaire’s writing.<sup>31</sup> According to Edkins, with the invention of the mechanical means of the production and reproduction of images –through the rise of photography- in the nineteenth century, the representation of the face was democratized -alongside industrialization and the democratization of politics. This added to the social process of individualization, as everyone in European society could possess a picture of themselves and others.<sup>32</sup> It also shows an earlier onto-epistemological understanding of the face as a marker of individuality, which translated into certain face politics characterized by the disciplinary society which will be discussed in the next chapter. Following Deleuze’s discussion of Foucault’s concept of disciplinary society, the disciplinary society is a system of discipline which seeks to mold individuals in certain enclosed spaces

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<sup>29</sup> Bueno, “The Face Revisited,” 77.

<sup>30</sup> Jenny Edkins, *Face Politics*, (London: Routledge, 2015), 2.

<sup>31</sup> Geertjan de Vugt, “The Polit-Dandy. On the emerge of a political paradigm.” PhD diss. (Tilburg University, 2015), 100 -101.

<sup>32</sup> Edkins, *Face Politics*, 2.

(prison, factories, ghetto's etc.), a productive force within the dimensions of space and time.<sup>33</sup>

The face serves the establishment of docile bodies, which according to Baudelaire, analyzed by de Vugt enforce a sense of harmony and unity in a time of tumult caused by individual freedom.<sup>34</sup>

### 1.2.2 *The Face as a Marker of Mass Individuation*

Following Gates, what followed was the rationalization of mass individuation and facial identification, which have been central to “technocratic” processes of bureaucratic rationalization, that Max Weber theorized as a core feature of Western capitalist modernization.<sup>35</sup> This photographic portrait opened the doors to new practices of state control and not only the control of individuals but also groups and populations. Categories of people were produced and recorded for various purposes, but mostly biopolitics – a Foucauldian notion. Following Edkins, this was to ensure the health and survival of the population as a whole and national identity using statistics and probabilities, which required this calculation and categorization of the face.<sup>36</sup> This opened the door towards the science of eugenics, - namely the ideas of phrenology and physiognomy- as the photograph could abstract the face as objects for scrutiny. These notions revolve around the belief that internal characteristics of personality are expressed through physical features of the shape of the head and the face in particular.<sup>37</sup>

According to Poole, Foucault claims that the bourgeois disciplinary gaze was not involved with the surveillance of the Other until the late nineteenth century. Although Foucault does not give an exact origin for racial discourse, Poole argues that Foucault did

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<sup>33</sup> Gilles Deleuze, "Postscript on the Societies of Control", *OCTOBER* 59 (Winter 1992): 3.

<sup>34</sup> Vught, "The Polit-Dandy," 105 – 106.

<sup>35</sup> Gates, *Our biometric future*, 33.

<sup>36</sup> Edkins, *Face Politics*, 102.

<sup>37</sup> Edkins, *Face Politics*, 103.

point toward the new technologies of regularization that emerged in the late eighteenth century, opening the discussion of visual discourses and technologies in the constitution of modern racial thought.<sup>38</sup> This was also the start of the use of statistics for predicting human behavior and the gradual shift of the logic of power from the individual to populations as the dominant object of power, and the shift from a disciplinary to a regime of control and security.<sup>39</sup> In conclusion, the process of individualization and the face as a marker of individuality ignited a certain face politics that searched for technocratic ordering of all these faces through the breakdown of the individual into individuals through facial recognition technologies. In the following chapter, I will discuss this shift and the implications for our face and society.

### 2.3 The Face and Technology

The face and representations of the face are still extremely powerful in contemporary society and politics. As discussed above and following Edkins, Gates, Deleuze, and Guattari one needs to understand that in these periods of different face politics, the face is not an innate object, but it exists and is contested in cultural, geographical, and historical contexts. The face that is presented as universal, is according to Gates the white man face.<sup>40</sup> Taking a slightly more intersectional approach, this normative face, the white man face also reflects norms of beauty standards, normalcy, socio-economic status, gender, and class, where aesthetics and politics are intertwined. This whiteness eventually becomes the default lens of these sociotechnical technologies, which are assumed to be unraced, ungendered, and neutral.

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<sup>38</sup> Deborah Poole, *Vision, race, and modernity: A visual economy of the Andean image world*, (Princeton University Press, 1997), 17.

<sup>39</sup> Bueno, "The Face Revisited," 79.

<sup>40</sup> Edkins, *Face Politics*, 4.

However, as argues by Benjamin, these technologies are creating vertical realities—surveillance and control for some, security, and freedom for others.<sup>41</sup> These vertical realities are also tied with the question of who is allowed to hide their face and who thrives being visible.

In this section, I will elaborate on the development of facial recognition technologies. This historical and political context will give insight into the politics behind the faces that are produced by said technologies today and contemporary representational practices and discourse. I will finish this section with the discussion of how digital vision technologies are transforming power relations and compare it with the above section about the history of politics of the face.

According to Gates, facial recognition technologies have been a combined public-private venture shaped by governance priorities.<sup>42</sup> This earlier commercialization of facial identification is part of the neoliberal reform policies, which at first seem to be an inevitable result of the tendency of the nation-state towards regimes of sovereign population control and security led by advancements in computer science and visual media technologies. These technological advancement and sociotechnical imaginaries about state-centered forms of political power, play an important part.<sup>43</sup> Gates argues that facial recognition technology promised to play a significant role in this process as an answer to the demand to individualize and classify by both state and corporate institutions. Building on the existing communication, identification and representational practices that centered the face, the primary aim of these systems was to enable more effective institutional forms of identification, social classification,

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<sup>41</sup>Ruha Benjamin, *Race After Technology : Abolitionist Tools for the New Jim Code*, (Cambridge: Polity Press, 2019), 101-105.

<sup>42</sup> Gates, *Our biometric future*, 27-28.

<sup>43</sup> Gates, *Our biometric future*, 27-28.



and control.<sup>44</sup> While emerging technologies like urban surveillance and facial recognition algorithms have been perceived as more “neutral” and objective than their predecessors, these technologies are still reproducing existing social inequities and racial bias. One can even argue that it is even harder to perceive these inequities as these technologies are fading away into our environment, becoming more invisible and black-boxed through the process of design, policy, algorithms, datasets, and categorization which are deepening the status quo.

According to Ruha Benjamin, these technological fixes are reinforcing the status quo rather than challenging inequity. These findings demonstrate what she calls the “The New Jim Code” (referring to the Jim Crow laws): “the employment of new technologies that reflect and reproduce existing inequities but that are promoted and perceived as more objective or progressive than the discriminatory systems of a previous era”.<sup>45</sup> In the same line of argument, Cathy O’Neil observes that racism and inequity are powered by arbitrary data gathering and spurious correlation, reinforced and deepened by institutional inequities, and again polluted by confirmation bias.<sup>46</sup> These digital technologies and environments are part of what Shoshana Zuboff calls “Surveillance Capitalism”<sup>47</sup> and which Jack Linchuan Qiu refers to as “iSlavery” in which black-boxed systems of extraction, categorization, commodification, and control are alienating people from their behavior, making individuals the hot commodity pushed into digital slavery and trapped in a global economic system relying upon and ignoring their oppression.<sup>48</sup>

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<sup>44</sup> Gates, *Our biometric future*, 28.

<sup>45</sup> Ruha Benjamin, *Race After Technology : Abolitionist Tools for the New Jim Code*,(Cambridge: Polity Press, 2019), 3.

<sup>46</sup> Cathy O’Neil, *Weapons of Math Destruction: How Big Data Increases Inequality and Threatens Democracy* (New York: Crown Publishers, 2016), 23.

<sup>47</sup> Shoshana Zuboff, *The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power* (New York: PublicAffairs, 2019).

<sup>48</sup> Jack Linchuan Qiu, *Goodbye iSlave: A Manifesto for Digital Abolition* (Urbana, IL: University of Illinois Press, 2016).

Companies are creating datasets by scraping billions of images from millions of different websites, converting all the images into mathematical vectors based on facial geometry, which are used for advertisement, but also law enforcement. Research showed that these systems are biased and falsely identify Black and Asian faces 10 times to 100 times more than white faces, leading to wrongful accusations by an algorithm.<sup>49</sup> Not only does this raise questions about the threat to privacy when it works, but also about the racist threats when it does not work due to embedded racial bias in the systems, algorithms, and datasets. The default lens of Whiteness of these sociotechnical technologies is assumed to be unraced, ungendered, and neutral, but are reproducing/ reinforcing inequalities.<sup>50</sup>

Circling back to both Foucault and Deleuze, we need to understand the algorithmic facial recognition technologies that are creating vertical realities, not from a disciplinary society, but a society with the mechanism of security and control. Following Bueno, the individual is no longer essential in the reproduction of power relations, but the “dividuals” are replacing the individual/mass dyad.<sup>51</sup> This means, that instead of a productive force within the enclosed dimensions of space and time, this productive force (our faces) is fragmented and are flowing through space and time. Following Deleuze, the language of control is now made of codes that mark access to information or reject it.<sup>52</sup>

According to Bueno, in the mechanism of dividualization algorithms are used to break down the face into pieces of data that are combined to predict certain characteristics of the face and individual.<sup>53</sup> When this is applied to whole categories of people or used to identify groupings of people according to their ethnic or racial origin, this idea is not too far removed

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<sup>49</sup> Kashmir Hill, “Wrongfully Accused by an Algorithm,” *The New York Times*, June 24, 2020, <https://www.nytimes.com/2020/06/24/technology/facial-recognition-arrest.html>

<sup>50</sup> Benjamin, *Race after Technology*, 101-105.

<sup>51</sup> Bueno, “The Face Revisited,” 80.

<sup>52</sup> Deleuze, “Postscript,” 4.

<sup>53</sup> Bueno, “The Face Revisited,” 80.

from the aforementioned sciences of eugenics.<sup>54</sup> <sup>55</sup> Technology has always been changing power relations through history and this specific passage from the disciplinary society with a focus on the individual to a society of control is utilized by digital technologies.

According to Bueno, this shift from the mechanism of discipline focusing on the individual to the mechanism of dividuation, is a shift in the diagram of power. He argues that algorithmic face recognition should not be understood as an automated panopticon but as an apparatus of (meta)data that goes beyond the task of individualization.<sup>56</sup> This means that it goes beyond the use of normalizing individual behavior and normalizing certain faces but predicts patterns of a given group. Following Foucault, Bueno argues that surveillance apparatuses such as facial recognition “do not define a pre-given norm that is later used to normalize each individual ... but rather use statistical calculations in order to identify curves of normality.”<sup>57</sup> “These technologies are made possible by machine-learning algorithms that no longer rely on a direct link between identity and resemblance, but instead, use data gathered from pre-and supra-individual levels to create self-modulating patterns and templates based on experimental and inferential procedures.”<sup>58</sup> Following Bueno, one can argue that the individual is disappearing and contested as a key object of power and politics. However, Edkins notes that the face remains of significance, political consequence, and the important apparatus of power.<sup>59</sup> Following this argument, Bueno argues that “algorithmic face recognition technologies are traversed by two contradicting tendencies: a weakening of the processes of individualization on the one hand, and an ever-growing centrality of the face as a mechanism of individualization on the other.”<sup>60</sup> This contradiction is key to gaining a better

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<sup>54</sup> Edkins, *Face Politics*, 103-104.

<sup>55</sup> Gates, *Our biometric future*, 107.

<sup>56</sup> Bueno, “The Face Revisited,” 80.

<sup>57</sup> Bueno, “The Face Revisited,” 80.

<sup>58</sup> Bueno, “The Face Revisited,” 81.

<sup>59</sup> Edkins, *Face Politics*, 3.

<sup>60</sup> Bueno, “The Face Revisited,” 81.

understanding of the face that is being produced as the solution to algorithmic facial recognition. According to Tyler Reigeluth, algorithmic facial recognition, are facilitating to an algorithmic governmentality, where the digital self and - thus the digital renderings of the face- becomes a cog in a larger machine of big data and statistical predictability.<sup>61</sup>

This machine now creates images of the face for other machines, with rarely any humans in the loop. According to Paglen these “invisible” images and faces are actively watching us and are fundamentally machine-readable regardless of a human subject, allowing automation of vision to exercise power on different scales than has ever been possible.<sup>62</sup> This has serious implications as shown in the examples above, and according to this invisible world of machines, images are hard to recognize for what they are. Namely, “powerful levers of social regulation that serve specific race and class interest while presenting themselves as objective.”<sup>63</sup> How can we understand this contradiction of the individual disappearing as object of power while the growing focus of the face as mechanism of power is becoming increasingly invisible? What has changed since Deleuze’s 1991 text about individuals and the society of control? And how can we say something about the onto-epistemological status of the face when faces are produced without a human subject? The goal is to discuss this question through the analysis of the CV Dazzle anti-face.

As shown in the above two sub-chapters, the face has always been a site of politics which needs to be understood in the context of the long history of representational practices of the face. While technologies utilize shifts of power, and the individual seems to disappear from political thought, the face remains a control mechanism that ensures a specific social production and normalization. The face is a social production, a social assemblage of specific

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<sup>61</sup> Tyler B. Reigeluth, “Why data is not enough: Digital traces as control of self and self-control,” *Surveillance & Society*, 12, no 2. (2014): 253, <https://doi.org/10.24908/ss.v12i2.4741>.

<sup>62</sup> Trevor Paglen, “Invisible Images (Your Pictures Are Looking at You),” *The New Inquiry*, December 8, 2016, <https://thenewinquiry.com/invisible-images-your-pictures-are-looking-at-you/>

<sup>63</sup> Paglen, “Invisible Images,” VI.

politics that needs to be understood from the social and historical context as described in the chapters above. The production of the anti-face as a solution to facial recognition needs to be analyzed as such and will give insight and reflect society and technology. Just like sociotechnical imaginaries, the produced face is a cultural form, epitomizing dreams, fears, desires, and the power relations and ideological conflicts of the societies that produce this visual discourse. The CV Dazzle anti-face is a face where the past and the present collide and is continually exchanging a message of crisis through the interfacing between face and technology. The implications of both form and use will be further elaborated in the following chapter, which will explain how the case study and new media art project CV Dazzle gains meaning through finding a common language between the anti-face and technology.

By understanding this we can start to question the issues about face politics and onto-epistemological understanding of the face by analyzing the CV Dazzle anti-face by Adam Harvey. This new media art project is analyzed from two different perspectives and through the combinations of both types of analyses, namely form, and use. The first perspective focuses on the form (aesthetics/artistic) and the latter on use (functionality) in relation to the technology. I hope to reflect on the thinking of this theoretical chapter and unveil the message of the crisis between face and technology.

### 3. Facing the Anti-Face



CV Dazzle Look 1. 2010. Hair by [Pia Vivas](#) Model: [Jen Jaffe](#)  
Original look for CV Dazzle thesis at NYU. Photo: ©Adam Harvey

*Figure 2. CV Dazzle look 1.*

### 3.1 The Anti-Face: Form and Aesthetics

The very meaning of the face is materialized in some form with a specific function in order to exist. It makes its disappearance and reappearance in different forms and uses – which can be understood as aesthetics and functionality. Therefore, besides functional properties, the artistic properties of the CV Dazzle anti-face also reflect certain face politics. A formal visual analysis will be performed to analyze the visual and artistic aspects of the form of the CV Dazzle anti face. Following Sylvan Barnet, a formal analysis focuses on the form the artist produces.<sup>64</sup> This form is made of elements and principles. In line with Barnet, Jeremy Glatstein argues that formal analysis allows one to translate what one sees into written words. Elements, lines, color, texture, and space are the building blocks of principles such as balance, composition, contrast, and emphasis.<sup>65</sup> The analysis explains the artistic properties of the new media art project and goes beyond merely describing them, as its focuses on the function of the properties and effects on the subject matter, deducing meaning of the artwork.<sup>66</sup> This analysis helps to deconstruct the CV Dazzle anti-face to grasp the relation between meaning and representation. The image analyzed is the very first CV Dazzle anti-face as shown above. The sub-question this section aims to answer is: How do artistic and formal properties reflect ideological assumptions about the face?

#### 3.1.1 Analysis: CV Dazzle Look 1

The very first anti-face design was created in 2010 as a proof of concept (figure 2). The image shows a woman looking straight into the camera. One can also notice that the medium (what the object is made of) overlaps. One could argue the image is the medium,

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<sup>64</sup> Sylvan Barnet, *A Short Guide to Writing about Art*, (NJ: Pearson, 2015), 48.

<sup>65</sup> Jeremy Glatstein, "Formal visual analysis: The elements & principles of composition." *The Kennedy* (2009): 2.

<sup>66</sup> Barnet, *A Short Guide*, 48 – 49.

however, the CV Dazzle anti-face has many different renderings in different settings. I argue that the face is the canvas that is painted and decorated, therefore the face is also the medium of the message that this specific media art project conveys. How the object (the anti-face) relates to the space around it, also substantiates this point. By keeping the background, a white space, the observer's attention is more strongly drawn to the face without any distraction; the face can therefore also not hide anywhere, but is open, exposed and meets the observer's gaze by looking back in a calm and direct way.

The space could be considered a placeholder that can be swapped to another setting. But what other artistic and aesthetical choices were taken to create this specific representation of the face? The artistic choices made reflect the power of the subject as described in the paragraph above. The following analysis of the composition and elements will substantiate this point. Looking at the image, the face and in particular the eyes are the center of attention. What did guide and direct the gaze to that specific focal point? Looking at the elements, there are obvious lines and shapes in the composition that work as a demarcation between contrasting elements. According to Glatstein, lines are used to lead the eye from one area in the composition to another.<sup>67</sup> This is also the case with this image. Starting with the lines around the body and the head, created through the backlight/background, followed by the lines that outline the face and the eyes. While these lines are created more organically - as they outline human forms - the lines are also used to create geometric shapes visible on the cheeks and the bangs with the eyes in between. Another obvious element is value – which is the degree of light and dark in a design. This is the contrast between black and white and all the tones in between.<sup>68</sup> It is the value between tones that create a face, as some parts of the face are naturally more highlighted and other parts cast more shadow. Besides the values,

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<sup>67</sup> Glatstein, "Formal visual analysis,"3.

<sup>68</sup> Glatstein, "Formal visual analysis,"3.



there is also a very prominent contrast between black and white and it is in this contrast that lays the meaning of the anti-face, namely power.

The woman is positioned in the foreground with no visible clothes that could otherwise grasp our attention, while the background is almost white. Her asymmetrical black hair frames her face and is in contrast with the background. The black and white stripes on her cheeks and the string of hair on her forehead are also contrasting with the rest of her face and the background. The portrait style looks like a mugshot style photograph, used to document, and identify an individual in the setting of law enforcement and biopolitics. These are both linked to disciplinary form of power, and the captured faces are used to categorize and therefore govern people. Despite her face being captured by technology, the artistic choices made reflect confidence and power of the subject.

The light colors, lightening of the picture and the contrasting elements also give the image as a whole and the face a sense of power. The lightening is coming directly from the front, which casts shadows framing her head and upper body, and the contours of her face. The face has naturally parts that are more highlighted, because of the different depths on the surface of the face. In the image the more highlighted parts are the bridge of the nose and the chin and shadows on parts of the face which naturally do not catch light directly, such as the area below the cheekbones, in the corner of the eyes and under the nose. Normally, the cheekbones are highlighted when it is hit by light, but in this image the cheekbones have black and white stripes painted on them.

Furthermore, while it is not prominent, the textures vary. One can see the texture of the skin and hair, but also the textures of the background and paint. However, they are barely noticeable, as everything is exceptionally smooth. The face paint almost melts into the models' skin and the dark hair is so straight and smooth, that it reflects the light around. All of these artistic choices were made to center the face in the picture, which in this case is the CV

Dazzle anti-face. Without any context or prior information, the image and the face in the image reflects the notions in chapter 2, in which the face and especially the white face has been prominent and more visible than other marginalized faces. This face is made powerful as it is not subjected to the technological eye of the camera, which captured this face. From the formal visual analysis, we can argue that the artistic choices of CV Dazzle anti-face such as form, shade, texture, and composition help to understand how the face is represented. The image is something powerful as images interact with the images in our head, which again guide us in how we see the world and our place in social and political spheres. The onto-epistemological understanding of the face does not come only from vision – what our eyes observe – but also from visibility: what face is made visible?

However, these aesthetical and artistic choices have also an important functionality which can be understood as a language on its own. The next step is to analyze how this CV Dazzle anti-face is interfacing – finding common language – with the code of the facial recognition technology.

### 3.2 The Anti-Face: Use and Functionality

The artistic properties of the anti-face have an important functionality, namely blocking facial detection and therefore facial recognition by algorithmic facial recognition technologies. To situate the case study of the anti-face in the long history of face politics, we need to look at it from a closer angle and in specific relation to technology. The conceptualization of the CV Dazzle anti-face is constantly negotiated with facial recognition technologies. Drawing upon the actor-network theory by Latour, to understand the social ramification, attention should not be given exclusively to the human, but also the

nonhuman.<sup>69</sup> On his website Adam Harvey shares a small part of the code he used to create and evaluate the CV Dazzle anti-face. Therefore, for this chapter I will focus on that specific part of the Viola-Jones algorithm code.

From a hermeneutic perspective, I treat the code not as merely functional but as a text. One that can be read and of which meaning is not determined by the intention of the programmer, but also by how it is received and circulated. Adam Harvey created CV Dazzle by reading the Viola-Jones code and by using a technique of reverse engineering. Through the CV Dazzle anti-face, the vulnerabilities of the algorithm software are made visible and manifested through CV Dazzle. Through this strategy, Adam Harvey created a face that makes visible and tangible the ways technologies shape the onto-epistemology of the face. I will use the method of critical code reading, a method coined by Marc C. Marino in “Critical Code Studies” (CCS). Code governs so much in our lives, including our face. Following Marino’s argument, it is important to not only understand what code does, but also what it means in a sociohistorical context.<sup>70</sup> “Like other systems of signification, code does not signify in any transparent or reducible way. And because code has so many interoperating systems, human and machine-based, meaning proliferates in code.”<sup>71</sup> Therefore, following Marino, “the meaning of code is contingent upon and subject to the rhetorical triad and discourse of speaker, audience (both human and machine), and message.”<sup>72</sup>

“In the process of its circulation, the meaning of code changes beyond its functional role to include connotations and implications, opening to interpretation and inference, as well as misinterpretation and reappropriation.”<sup>73</sup> Marino goes on to state that “meaning grows out of

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<sup>69</sup> Bruno Latour, *Reassembling the social: An introduction to actor-network-theory*, (Oxford: Oup Oxford, 2007): 78.

<sup>70</sup> Mark C. Marino, *Critical Code Studies. Software Studies*, (Cambridge, Massachusetts: MIT Press, 2020), 40.

<sup>71</sup> Marino, *Critical Code Studies*, 4.

<sup>72</sup> Marino, *Critical Code Studies*, 4.

<sup>73</sup> Marino, *Critical Code Studies*, 4-5.

the functioning of the code but is not limited to the literal processes the code enacts”.<sup>74</sup> This means not to create a language separate from the work of programmers, but building further on the preexisting terminology and analysis. It is to go beyond the functionality. Therefore, to explore the code, it is important to first read the code and its documentation to grasp what exactly the code does -functionality. Following the CCS method, the first step is to scan guide and commentary texts.<sup>75</sup> First I will explain the Viola-Jones algorithm using documentation and the commentary provided by Adam Harvey. After that I will analyze the functionality of the code and how it translates to the CV Dazzle anti-face. The third step is interpretation of the meaning of the code in relation to the CV Dazzle anti-face and the socio-historical context. Through these steps, the goal is to gain more insight to answer the research questions: How do CV Dazzle anti-face art project critique and make tangible the ways algorithmic facial recognition technologies shape the onto-epistemology of the face and politics around the face?

### 3.2.1. *Documentations and Commentary Text*

The CV Dazzle looks are designed for the vulnerabilities in the Viola-Jones Haar Cascade “face detection” algorithm. CV Dazzle is designed to block face detection, thereby blocking subsequent face recognition algorithms.<sup>76</sup> Face recognition is often described as a process consisting of four steps.

Figure 3 is taken from the Handbook of Facial Recognition<sup>77</sup> and show the four different steps of facial recognition. The first step in the overview is “face and landmark localization” is the

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<sup>74</sup> Marino, *Critical Code Studies*, 39.

<sup>75</sup> Marino, *Critical Code Studies*, 27.

<sup>76</sup> Adam Harvey, “CV Dazzle: Computer Vision Dazzle Camouflage.” Accessed on June 15, 2021. <https://cvdazzle.com/>

<sup>77</sup> Li Z. Stan and Anil K. Jain, eds., *Handbook of Face Recognition*. (London: Springer; 2011), 4.

first step of face detection: the tracking and location of face in the image. This is where the Viola-Jones algorithm comes into play.

But how did Harvey find the vulnerabilities in this algorithm? In an interview Borenstein he explains that with barely any knowledge about implementing face detection in

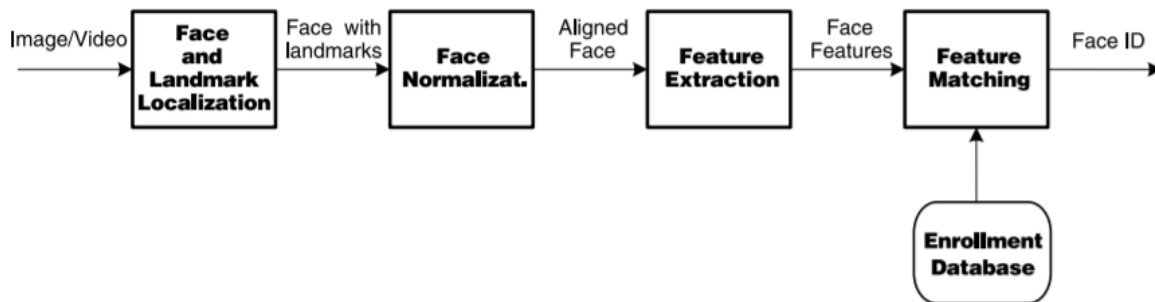


Figure 3. Different steps of facial recognition.

processing<sup>78</sup>, he linked processing to the Open CV library<sup>79</sup>. “But it’s so obscure that you have no idea what’s going on.”<sup>80</sup> Harvey explains in the interview, that when running the processing in real-time on his own laptop, the first thing he saw was a square around the face. “It’s a square because it’s actually a square that you’re looking for.”<sup>81</sup>

What Harvey found was the Viola-Jones algorithm. The Viola-Jones algorithm is named after the researchers Paul Viola and Michael Jones, who created the visual object detection framework that is in comparison with predecessors’ algorithms extremely rapid while achieving high detection rates.<sup>82</sup> Some key elements are the learning algorithm which select critical visual features and yields efficient classifiers. Another is “a method for

<sup>78</sup> Processing is an open-source programming language and environment for people who want to create images, animations, and interaction. <https://web.archive.org/web/20120407070401/http://processing.org/>

<sup>79</sup> Open CV stands for Open Source Computer Vision Library.

<sup>80</sup> Greg Borenstein, “Adam Harvey Explains Viola-Jones Face Detection,” *Makematics* (2012) <https://web.archive.org/web/20120408080754/http://www.makematics.com:80/research/viola-jones/>

<sup>81</sup> Borenstein, Adam Harvey Explains.

<sup>82</sup> Viola, Paul, and Michael Jones. "Robust real-time object detection." *International journal of computer vision* 4.34-47 (2001): 2.

combining classifiers in a “cascade” which allows background regions of the image to be quickly discarded while spending more computation on promising object-like regions.”<sup>83</sup>

The cascade is like a series of waterfalls, in various stages it discards non-faces. When a small part of the image enters the cascade, the output is *no* or *maybe*. When the output is *maybe*, it goes to the next stage and so forth. When the output is *no*, the image is immediately disregarded in any stage. Following Harvey’s explanations, the Viola-Jones algorithm works by looking for features and all these features are rectangles. Inside the rectangles are again smaller rectangles and inside these smaller rectangles are pixels. The rectangle that makes up the face in Viola-Jones is just a small part of the overall head.<sup>84</sup>

“It’s funny when you learn about it. If you learn about any kind of face detection or face tracking, you learn that the face is really small. It’s a small square in someone’s head, which is just this little space here [indicating his face]. All of this other stuff is not even important. It makes you look at peoples’ faces in a new, weird way.”<sup>85</sup> Those squares are eventually the weak part of the whole facial recognition process and the premise of the CV Dazzle anti-face.

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<sup>83</sup> Viola & Jones. "Robust real-time object detection,"1.

<sup>84</sup> Borenstein, Adam Harvey Explains.

<sup>85</sup> Borenstein, Adam Harvey Explains.

## 3.2.2 Basics of Python

```

import cv2 as cv
im = cv.imread(filepath)
im_gray = cv.cvtColor(im, cv.COLOR_BGR2GRAY)
cascade = cv.data + "haarcascade_frontalface_default.xml"
classifier = cv.CascadeClassifier(cascade)

faces = classifier.detectMultiScale(
    im_gray,
    scaleFactor=1.05,
    minNeighbors=3,
    minSize=(50, 50)
)

print("Found {} face candidates".format(len(faces))

# Draw rectangles over faces
for (x, y, w, h) in faces:
    cv.rectangle(im, (x, y), (x+w, y+h), (0, 255, 0), 3)

cv.imshow("Result" ,im)
cv.waitKey(0)
cv.destroyAllWindows()

```

Figure 4. Code OpenCV Haarcascades

The above code (figure 4) is from Adam Harvey website, he used it to create and evaluate the CV Dazzle anti-face.<sup>86</sup> Therefore, for this analysis I will focus on that specific part of the Viola-Jones algorithm code. The code is inherently part of the CV Dazzle art media project because it is this code that the CV Dazzle anti-face is interfacing with. Without this code, there would be no CV Dazzle as it is now. The above code is constructed out of Python. Python is a programming language, with an object-oriented approach and language construct. In short, this means that Python has on the one hand a syntactically part in the language, such as *Print* and *Import*. But, on the other hand, it is also OOP (Object-oriented programming)

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<sup>86</sup> Harvey, "CV Dazzle,"

which means the programming language relies on classes and objects, making the code less linear, but more like an assemblage with elements, functions, and objects that can be swapped.

In short, what you see is the start and the end of the processing in code. It starts with the import of the CV library – an existing library. CV is the existing object and every part of the code which starts with CV is a function built into CV. `Cv.rectangle`, I.e `cv.waitKey(0)`, `cv.destroyAllWindows`. In short, the code in red is a function which uses language constructs. The code in yellow and between quotation marks are numeric literals.

### 3.2.3. Analysis: Code

Using the information provided by Adam Harvey and the commands explained above, this part of the analysis will take a more detailed look at the code (figure 4), to show how the commands determine the outcome if something is a face and what meaning and values the code attributes to a face.

When diving into Viola-Jones, Harvey found a series of files like “haar\_cascade.xml”, “frontal face”, “haarcascade\_eye”, left eye, right eye, glasses, mouth, nose etc. When opening these .XML files one can see nodes with sub-nodes. Following the explanation of Harvey, all the way into the last node, there are numbers like 3, 1.05, 50. These define the shape of what is called the “Haar “features. Starting with the *import* function on the first line of code, this token causes the importation of another file/function/dataset/library to the module. In this case, the open CV library is linked to the processing. This library consists of pretrained

```
import cv2 as cv
im = cv.imread(filepath)
im_gray = cv.cvtColor(im, cv.COLOR_BGR2GRAY)
cascade = cv.data + "haarcascade_frontalface_default.xml"
classifier = cv.CascadeClassifier(cascade)
```



classifiers and methods and is important for the face detection algorithms to work. The command *import* has its origins as a command to convey in meaning, coming from the Latin word *importare*, but also as command to bring in from abroad.<sup>87</sup> Without the *cv2* library, the processing would not function. Both commands have the same meaning back in the 15<sup>th</sup> century and nowadays in code, which shows not only an isomorphism, but also the realms of interpretation of meaning and value in 1 line of code.

The first method is `im_gray = cv.cvtColor(im, cv.COLOR_BGR2GRAY)`, which converts the images to a grayscale color, making it easier to detect contrast. What follows is the *Cascade* = `cv.data` The cascade is a machine learning approach in which a lot of “positive” and “negative” images are used to train the cascade classifiers.

```
faces = classifier.detectMultiScale(
    im_gray,
    scaleFactor=1.05,
    minNeighbors=3,
    minSize=(50, 50)
```

According to the code, faces are classifier consisting out of four parameters. These parameters are gray scale images, `scaleFactor` is the size/resizing of the face to be detectable, `minNeighbors` affect the quality of detected faces and `minSize` is minimal size of the object in the image.

```
print("Found {} face candidates".format(len(faces))

# Draw rectangles over faces
for (x, y, w, h) in faces:
    cv.rectangle(im, (x, y), (x+w, y+h), (0, 255, 0), 3)
```

---

<sup>87</sup> Online Etymology Dictionary, “Import,” accessed on December 20, 2021, <https://www.etymonline.com/search?q=import>

The `# Draw rectangles over faces` is a comment in the code written by Adam Harvey. These rectangles are drawn on different x,y,w,h axes on the face. This process is visualized in the image below. These black and white rectangles are Haar features found in the "haarcascade\_frontalface\_default.xml". This is an example of an early stage in the Haar cascade. Each black and white rectangle/square represents a feature that the algorithm hunts for in the image, which in simple terms is comparing contrast between pixels and gives them a score. To compare the contrast, the images are converted to grayscale color. Therefore, the face is deducted to merely contrasting pixels in rectangle shapes, affording the computer to understand object as faces or discard it as non-faces. At every phase it rejects “nonconformity,” it is simply put a yes/no algorithm.

#### 3.2.4 Visualization of the code

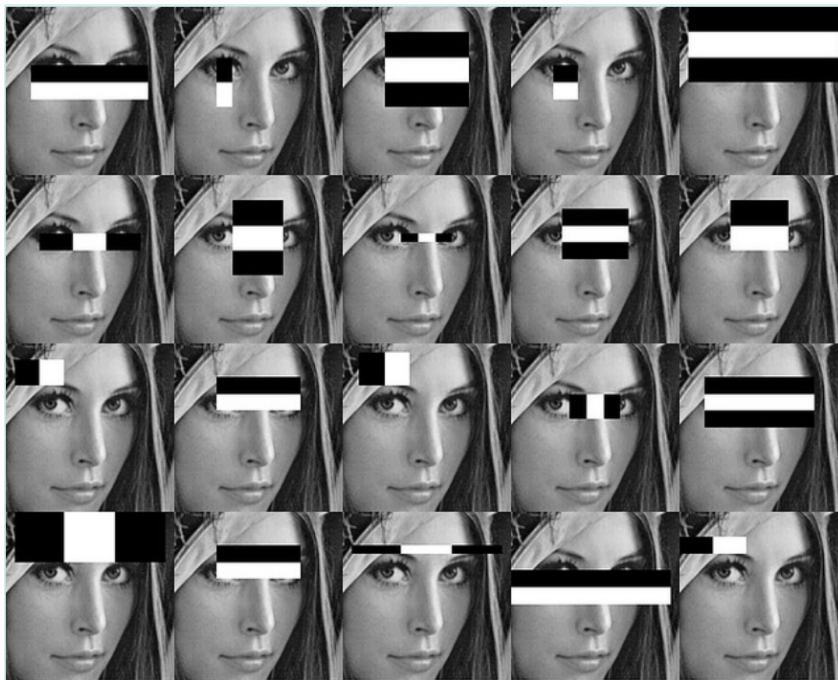


Figure 5. Visualization of the code

The above image (figure 5) is a visualization created by Adam Harvey and is part of the CV Dazzle project.<sup>88</sup> It is a visualization of the processing of the face. What you see are

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<sup>88</sup> Harvey, “CV Dazzle,”

the different rectangles that are comparing contrast in the greyscale image. The pretrained classifier in the code learned that “a face” consists out of contrast in certain areas of the image, giving it a score whether the object in the image is a face. Together this creates an outcome whether an object is classified as a face. As seen in the code, during the processing of the object, the face is constructed. It is a result of the code, the imported modules, and its properties. Following this detection, the process of face recognition starts, which is the extraction of features and matching of the face with other databases. As shown in the visualization by Harvey, the code perceives the face as an object. An object that consists out of contrasts in pixels, nothing less and nothing more. We can ask ourselves, is this a face? And what does this mean for our understanding of the face? The faces in the image that are processed by the code seem natural. But what do we understand as a ‘natural face’? In human eyes the face seems natural, something innate, a universal entity. But as shown in the lines of code, the face is constructed out of pixels and only giving meaning to it when it is processed and linked with other databases. The algorithm creates images of faces which are fundamentally machine-readable regardless of human subject. Harvey’s CV Dazzle makes visible these invisible images and following Reigeluth thinking, these invisible images should be recognized as powerful levers of social regulations which present themselves as objective. Through the reverse engineering and visualizing the code, Harvey added critical value to the CV Dazzle anti-face, which already had a certain aesthetical and artistic value.

The code determine how CV Dazzle has to interface with the code. However, it also shows certain embedded values and implications. It reveals a small aspect of the world, which is normally invisible to humans, but also highlights the onto-epistemological understanding of the face. Therefore, I ask how does CV Dazzle make tangible the ways algorithmic facial technologies shape the onto-epistemology of the face? The CV Dazzle anti-face was created to block face detection and therefore also the following steps of face recognition. The media-

art project repurposes the language of the code it is interfacing with, creating something functional but also artistic and meaningful. While at first the language of the facial recognition technology was something invisible and blackboxed, a small part is made visible.

First, Adam Harvey started with the algorithm, in this case the Viola-Jones algorithm. He found a small part of the code which showed the processing of the face, the yes/no algorithm based on the contrasting of pixels found in rectangle areas. The following, he visualized this processing, and what you see is squares hunting the face, comparing contrast and in every phase of the process rejecting or accepting if something is determined a face. The face is at first just an object and after the processing it is decided whether this object is a face. The code and therefore the facial recognition technology present even imposes the face on us as something universal. After the object is categorized as a face, the next step of the technology is to determine the identity by connecting more algorithms and datasets. This universal face is therefore the starting point of the over-determination of our identities, over-coding people with faces and rejecting “non-conformity”. Onto-epistemology is not only about the nature of the face, but also about how it is made knowable to others, what knowledge emerges. Through the analysis of the CV Dazzle anti -face we see a glimpse of this invisible world of abstractions and mathematical processes of the face and a message of crisis, where past and present collide. What does this message of crisis tell us about the onto-epistemological understanding of the face and the face politics following this understanding?

## 4. Where Past and Present Collides

Our faces are demanded to be read by both technologies and humans throughout history. The face is the primary of visual representation and even sets the conditions of visibility. These face politics do not operate in a vacuum and have social and cultural ramifications. Present-day, in every sphere of society, we find algorithmic facial recognition technologies scanning our faces and producing invisible, black-boxed images of faces, machine readable without human subject. These invisible images of the face are powerful levers of social order. Adam Harvey's new media art project CV Dazzle anti face makes tangible the face politics and questions the face in new media art and technology through the process of "interfacing," finding a common language between face and technology. This common language is found in the aesthetical properties of the CV Dazzle anti-face as well as the functional properties which interface with a specific part of the code. The CV Dazzle anti-face unveils the message of crisis, where past and present collide. Questioning how we need to understand the face in relation to new technologies in order to face the future.

### 4.1 Artistic Properties

The formal analysis of the CV Dazzle anti-face shows that the face itself is presented as a blank canvas that can be dazzled to be powerful. All artistic choices and elements, from composition, lighting to textures creates this image of a face that despite being captured by the technological eye of the camera, reflects confidence against the potential disciplinary forms of power by technology. Without considering the functional properties of the CV Dazzle artistic elements, it gives us insight into which face is made visible and how this face is understood. This idea of the face as the medium itself, as a blank canvas can be interpreted as the idea of the face as something universal. The implications of presenting a face as universal, means that the degrees of deviance of this universal face have social ramifications.

The artistic choices on its own are also in line with this idea of the face as a marker of individuality. As discussed in chapter two, traces back to the European imagination, where the portrait specifically worked as technology producing the face as a marker of individuality. But this was only the case for those in power, the universal face, the white man face. From analyzing the artistic properties of CV Dazzle look number 1 using formal analysis, we can come to understand that this face is presented as powerful and not subjected to the disciplinary power of the technological eye. Which is in line with the historical trajectory of our onto-epistemological understanding of the face as a marker of individuality.

This face being presented as powerful makes sense as the CV Dazzle anti-face is presented as a strategy against the technical eye of the algorithm. With this anti-face the subject has what Monahan calls the right to hide from the technological eye in plain sight.<sup>89</sup> But this right to hide, which also is the right to be visible, is not for everyone. As discussed in the theoretical chapter, Benjamin states that technology is creating vertical realities. Namely security for some and surveillance for others.<sup>90</sup> This argument can also be used for our faces and the degrees of deviance of the presented universal face. Just as the face in the past, the face as a marker of individuality, this individuality and having the decision to be visible or hide your face is only for those in power. While the face from the past is still present in the artistic properties of CV Dazzle, these artistic properties are also functional which reflects how present-day machines see and represent the face.

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<sup>89</sup> Monahan, right to hide, 162.

<sup>90</sup> Benjamin, *Race After Technology*, 101.

## 4.2 Functional Properties

As mentioned before, the artistic properties on their own seems to reinforce the idea of the face as a marker of individuality. However, these artistic properties have important functional properties. These functional properties are unveiled by looking at a piece of code of the Viola-Jones algorithm provided by artist Adam Harvey. Without this piece of code, the presented CV Dazzle anti-face would not exist in the first place. The code in Python is object-oriented, which means the language relies on classes and objects. It is less linear and can be best understood as assemblage. While analyzing the code, a lot of data is still invisible to me; for instance, the *cv.data* which means I cannot see what positive and negative faces are used to train the classifiers. Visible is referring not only to publicly accessible, but also referring to the data set and the mathematical processes of the creation of the dataset being complex and machine-read only, I only see a glimpse of the whole assemblage. This means that I cannot see what positive and negative images of faces are used to train the classifiers. But I also cannot grasp how these faces are extracted and processed in the first place before ending up in a dataset. This is also exemplary for the entire process of face recognition as there are many more datasets and processes that are invisible. For example, later in the face recognition process the object that is classified as a face is matched with other data sets to match an ID with the face, which can also lead to linking information such as socio-economic status, health status etc. This complexity of the entanglement of both human and non-human (technology) reflects again the societal relevance of art making these black-boxed processes tangible.

Looking at the Haar cascade and the visualization of the code, this showed how the face is deducted to merely contrasting pixels in rectangle shapes subjected to a yes/no algorithm. It is rejecting nonconformity based on squares and comparing contrast. It is presented as neutral and even objective. However, this is only a glimpse of the complex

algorithm. Adam Harvey CV Dazzle anti-face reflects this yes/no algorithm of the face detection phase. These simple squares are reflecting the ways machines are looking at faces. Facial recognition technology and computer vision technology are producing mathematical abstractions from the faces they are analyzing. Producing new images of faces using classifiers, objects, cascades, and training sets. According to the code, our faces consist of pixels and contrasting squares put into an analytic loop without human interference.

Images and system representations of our faces are powerful, and there is an extensive line of inquiry how these representations and images are co-producing our culture, society, and even onto-epistemological understanding. Representation and meaning of the face have always been concepts that helped us understand how these images of the faces are harnessed to serve but also resist power. But what happens if these images of faces become invisible and machine-readable only? We now can only question the output of these machines, which allows the exercise of power on levels and scales that are not foreseen. The CV Dazzle anti-face interfaces with the Viola-Jones algorithm through the artistic properties, which become functional in relation to the code. Using the same language as the code against the code. Not only does it block face detection, but most importantly makes tangible of how computers see our faces, instead of how humans see faces.

### 4.3 A Message of Crisis?

This research started with the quote by Welchman; “we find it [the face] one of the places in representation where the past and the present collide most powerfully, and continually exchange a message of crisis.”<sup>91</sup> The past is still present through the artistic properties and the focus on the individual and their faces, while the present comes into play through the process of interfacing between the functional properties of the CV Dazzle anti-

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<sup>91</sup> Welchman, “face(t)s,” 131.



face and technology. This reflects the way machines are processing our face and therefore questioning what face politics this entails. This message of crisis is that in current face politics, the processes of extracting faces and exerting power of those faces are invisible and machine-readable only. While our vocabulary and our onto-epistemological understanding of the face is still from the past. Previous shifts in face politics are based on human understanding of the face, but in order to understand and discuss the shift in face politics occurring since the rise of facial recognition technologies we need to challenge our onto-epistemological assumptions about the face and link the social ramifications of these assumptions.

Facial recognition technologies used by both public and private stakeholders are not going anywhere. It is prevalent in many cases such as the social credit system in China, in which 400 datasets (both private, public and commerce data) are collected and 537 variables are adopted to identify every aspect of each actor.<sup>92</sup> All this is linked to one's face. In the EU, the discussion around facial recognition started with the Clearview AI controversy, a data set of million faces scraped from social media used with law enforcement from many EU countries on the client list.<sup>93</sup> The disciplinary and controlling power from the past are still dwelling in these technologies and are surveilling mostly people whose face is not the norm, namely marginalized groups such as people of color, black people, indigous people, people from the LHBTIQ+ community, people from a low socioeconomic class. Today's selfie is tomorrow's biometric profile, and today's "universal face" may be tomorrow's degree of deviance. And in order to discuss how the face not only represents, but also actively

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<sup>92</sup> Fan Lian *et al.*, "Constructing a Data-Driven Society: China's Social Credit System as a State Surveillance Infrastructure," *Policy & Internet* 10, no. 4 (december 2018): 429, <https://doi-org.proxy.library.uu.nl/10.1002/poi3.183>.

<sup>93</sup> F. Ragazzi *et al.*, *Biometric and behavioural mass surveillance in EU member states: report for the Greens/EFA in the European Parliament* (Brussels: Greens/EFA, 2021), 18, <https://hdl.handle.net/1887/3256585>

intervenes, we need new media art to make tangible these black-boxed processes of machine-read-only faces.

The analysis of the CV Dazzle anti-face as a socio-technical critique shows a glimpse of the landscape where new faces are produced. This technological landscape is more complex than just the Viola-Jones algorithm. Even artist Adam Harvey stated that the archived look number one and other archived CV dazzle looks do not work on current face surveillance using deep convolutional neural networks (DCNNs). With the rise of neural networks, the processes of abstracting and producing faces are more complex and more black-boxed than ever before. Despite these developments in the realm of face surveillance, this study is still relevant to show how we need new media art to make tangible the social ramifications these technological advancements have on our understanding of the face. It was beyond the scope of this research to analyze the outcome of facial recognition technology in daily practices of society. The scope of this study was from a cultural perspective, focusing on the power relation between the face and technology, exploring the concept of face politics from a Western trajectory and discussing the current onto-epistemological state of the face. While it was briefly touched upon in this study, further research is recommended from a more intersectional approach on how face surveillance and the black-boxed face produce structures of gender, class, beauty standard and racism.

## 5. The future of the face?

The overall outcome of the analysis of Adam Harvey's CV Dazzle anti-face shows and questions the positioning and representation of the face in new media art and technology. The study demonstrates that by looking at technology and the face through a cultural lens, we can unravel the message of crisis between past and present. The main outcomes of this have been the explanation of interfacing between code and the face, through the artistic and functional properties of the CV Dazzle anti-face. This common language that is created by the CV Dazzle anti-face highlighted the ideas of face from the past, but also questioned the present and the future of the face. Showing how there is a constant friction between our faces and the faces produced by technology. Questioning how the face not only represents, but also actively intervenes. In addition, this research shed light on the pioneer role of new media culture and art in this discussion.

In this master thesis, I explored Adam Harvey's CV Dazzle anti-face new media art project through the lens of face politics, visibility and onto-epistemological understanding of the face in an era of facial recognition technologies and by attempting to answer the research question: *How is Adam Harvey's CV Dazzle anti-face media art project an example of a techno-social critique to present-day face politics?*

I first contextualized this question by situating face politics and the onto-epistemological shifts throughout western history. Starting with the face as apparatus of those individuals in power and on the other end the "faceless masses," followed by the face as marker of mass individuation in which the face also serves the establishment of "docile bodies." The face became subject of disciplinary gaze, with a gradual shift of the logic of power from the individual to populations as the dominant object of power, the shift from a disciplinary society towards a society of control. The face politics of the latter is further

established with the rise of facial recognition technologies, where the face is used to turn people into “dividuals,” and the individual is disappearing. But what shift is happening now? In this black-boxed process new faces are created which are machine-readable regardless of human-subject, presented as subjective and only visible to humans in specific circumstances and short periods of time. Are we still relying on the face as something innate and universal? How can we understand this contradiction of the individual disappearing as an object of power and on the other hand the growing focus of the face as a mechanism of power whilst it is also becoming increasingly invisible?

The case study in chapter 2 reflects the thinking and discussion of the theoretical chapter. Using CV Dazzle anti-face (look number one) as my case study and additional documentation provided by the artist Adam Harvey as my corpus. Following the case study, I proposed using two methods. Namely: formal analysis and critical code reading. Combining both methods allowed me to analyze both the artistic properties and the functional properties, revealing how the CV Dazzle anti-face is interfacing (finding common language) with the code of the Viola-Jones algorithm and how this reflects a message of crisis, where past and present collide. From analyzing the artistic properties of CV Dazzle look number 1 using formal analysis, we can come to understand that this face is presented as powerful and not subjected to the disciplinary power of the technological eye. Which is in line with the historical trajectory of our onto-epistemological understanding of the face as a marker of individuality. From analyzing the code and how the CV Dazzle anti-face interfaces with these specific parts of the code, we see that the artistic properties also have functional properties. These functional properties are interfacing (finding common language). They are not only unveiling the weakness of the code but also reflect how machines are looking at faces and translate this again to how humans look at faces through the artistic properties. All computer-vision systems – not only the Viola Jones algorithm – are producing mathematical

abstractions from the faces they are analyzing. Composed of classifiers, cascades, classes and objects and invisible training sets. It is through the CV Dazzle anti-face that we see a glimpse of this invisible world of abstractions and mathematical processes of the face.

Following the discussion in chapter 3, we came to understand how the CV Dazzle anti-face represents a message of crisis regarding our face. As mentioned before, the representation of the face is where the past and present collide. The past is still present through the artistic properties with the focus on the individual face and the disciplinary face politics. While the present comes into play through the process of interfacing between the functional properties of the CV Dazzle anti-face and technology. This reflects the way machines are looking at our face. Previous shifts in the history of face politics are based on human perception and how humans look at the face. The CV Dazzle anti-face is an example of techno-social critique as it unveils the message of crisis, namely the invisible way of extracting and processing faces. How we understand the face is not just about vocabulary, but it has some serious onto-epistemological assumptions, which have social implications. The theoretical concepts and our understanding of the face we use to analyze the face regarding visibility – namely what faces are visible and how they are made visible – are too ambiguous when it comes to the machinic and computer landscape of algorithmic facial recognition technologies where the faces are invisible. While the CV Dazzle anti-face is a good first step of this discussion, namely: how are we going to discuss face politics when our current way of looking at the face cannot be applied to this technological landscape?

Overall, the research has shown the message of crisis between past, and present represented in the CV Dazzle anti-face, how the abstract machine of faciality is getting increasingly black box through mathematical processes of abstraction, while we are still wanting to discuss this from our onto-epistemological understanding of the face that is still in the past. Not only showed the analysis of artistic and functional properties of the CV Dazzle

anti-face a glimpse of this new realm, but it also contributed to the long past due discussion of the future of our face. CV Dazzle is exemplary how the new media art has the possibility to make tangible this invisible technological realm where faces are flowing through space and time in tiny fractions and therefore be a catalysator of this debate. To understand and see the faces produced by machines, we need a new way of looking and make room for new media art projects in this societal discussion.

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<b>Images</b>	<b>Source (retrieved from)</b>
Figure 1: CV Dazzle Test Patterns and Lookbook 2010-present.	<a href="https://cvdazzle.com/">https://cvdazzle.com/</a> .
Figure 2: CV Dazzle Look number one.	<a href="https://cvdazzle.com/">https://cvdazzle.com/</a> .
Figure 3: Different steps of facial recognition.	<a href="https://doi.org/10.1007/978-0-85729-932-1">https://doi.org/10.1007/978-0-85729-932-1</a>
Figure 4: Code OpenCV Haarcascades.	<a href="https://ahprojects.com/cvdazzle/">https://ahprojects.com/cvdazzle/</a>