Chapter 9: Conclusion

Contribution to the field

This study has explored the technology of automated facial recognition through the discourse of visual culture studies and contemporary artistic practice. This analysis addresses one of the central issues of contemporary visuality, that is, the technological advancement of forms of machinic vision through AFR technology and the associated shift in our understandings of what it is to see and be seen. The discussion has addressed a general problematic of automated recognition and framed its enactment as a technical, cultural and philosophical process. A primary theoretical aim has been to approach the recognition process of AFR technology as an example of machinic vision, that is, a mode of perception involving a disembodied perspective, and to analyze how it operates in contemporary society. Taking the processes of an AFR method as its point of departure, this study has shown how machinic vision is technically defined through an automated operation of recognition. It has, further, explored a history in which statistics and vision have been intimately connected, revealing this connection to be an organizing principle of AFR processes and a representational mechanism through which automated recognition occurs. Contemporary examples of artistic practice have provided further insight into the contexts of AFR implementation and suggested new approaches to the conceptualization of this technology. As I have shown, the artworks included in this study also actively reimagine the processes placing them in dialogue with cultural and socio-political contexts

broadening our understanding of the dialectics of recognition in a machine-vision process.

Through its exploration of the shifting role of the image from pictorial to algorithmic with the advent of digital networks, this analysis contributes to the field of visual culture studies.[1] Technologists have argued that machines do not see – that AFR technology does not relate to historical discourses on visuality or photography but rather introduces an entirely new digital landscape in which all visual input, whether pictorial or coded, is and should be considered as data. While taking this view into account, I argue that contemporary digital technologies and the infrastructures in which they operate do not present an entirely new world but rather carry within them historical continuities of cultural and visual logic. With reference to concepts such as the technical image and the operational image,[2] notions that track this shift in the role of images as information, I have approached the eigenface image as an object of inquiry. The eigenface image provides an image of data and, as such, serves as a meeting point for human perception and algorithmic perception. I have used the example of eigenface to reflect on this tension between image and data. This analysis does not confound images with data but rather attempts to clarify the complex relationship between the two. In relating the representational mechanisms of AFR technology to the historical practice of composite portraiture within the sciences, philosophy and art, I have explained the way this technology relies on a cultural logic that involves the merging of statistics with vision. By tracing this statistical way of seeing, I have brought to light the nuanced relationship between images and data, rather than simply suggesting that there is a mutually exclusive relationship between these two categories.

This analysis also makes a methodological contribution in its departure from traditional approaches within the field of visual

1 For more on this topic see Hito Steyerl, "A Sea of Data: Apophenia and Pattern (Mis-)Recognition," *e-flux Journal* 72 (April 5, 2016), https://www.e-flux.com/journal/72/60480/a-sea-of-data-apophenia-and-pattern-mis-recognition/.

2 Vilem Flusser, *Into the Universe*, 10; Farocki, *War at a Distance*.

culture: namely, it expands the scope of analysis beyond the image to include the processes by which the image is produced. In the context of analyzing machinic vision, this is imperative if we are to understand the ways in which the image operates and to reveal, interrogate and critique the conditions of algorithmic vision. Referring to the work of Jonathan Crary[3] and his analysis of the historical construction of vision through the position of the observer, this study of a particular AFR method has attempted to explain how its technology embodies a *machinic* observer, and to explore the historical continuities and discontinuities present in this new kind of visual organization. This study has shown how an analysis of the visuality of AFR technology can contribute to a broader understanding of the varying modes of perception found in contemporary society and their roles in intervening across social, political and cultural terrains.

This analysis joins certain other scholarly works in critiquing the limitations of AFR technology from a perspective in the humanities.[4] Drawing on theoretical perspectives from surveillance studies, gender and race studies, and media and communications studies, these previous scholarly works have not approached the subject matter from the standpoint of the sciences, that is, from within the fields in which these technologies have been developed, but from beyond them, in order to achieve more expansive notions about what counts as the success or failure of biometric technologies and to understand their cultural, political and social implications. Similarly, this analysis approaches AFR technology as a form of machinic vision by bringing its processes into a dialogue with a theoretical framework premised on visual culture and its associated political, cultural and philosophical ideas.

The findings of this analysis support a central critique leveled by the authors of many of these previous works: that recognition by an AFR system enforces normative categories of institutionally based identity in the service of ever-tighter biopolitical control. This is analyzed through the discussion on the ways of seeing em-

3 Crary, *Techniques of the Observer.*

4 See discussion in Cultural Analysis of Biometrics: Previous Scholarship, p. 22.

bedded in the eigenface method and its reductive representational mechanisms. In an operation of recognition carried out by an AFR system, any understanding of identity that is both subjective and fluid gets negated. At a time when identity politics is in the ascendant and self-generated notions of identity are crucial to political agency, AFR systems automate the enforcement of institutionally based identities. This enforcement of normative categories of identity has the potential to disproportionately affect those groups that are already vulnerable and marginalized in relation to systems of governance including the distribution of state services, border control and policing – three key contexts in which AFR is increasingly being employed. For AFR systems are not only implemented in contexts of security and risk mitigation; they are also used to grant or deny access to resources. The negation of recognition may be just as dangerous as being unwittingly registered in a biometric database. This study of the machinic ways of seeing used in a particular AFR method of eigenface has revealed a history of the enforcement of institutionally based identities; these identities are further operationalized through these automated technologies of recognition.

Revisiting the Aim: Looking Back

In sum, the problem with AFR and its machinic way of seeing is that it applies a statistical and thereby reductive method of recognition to a subject whose identity cannot ultimately be measured, defined or known by these means. This study began with three research questions, the first of which asked how recognition is defined in an AFR method. The analysis of the eigenface algorithm in Part I explored three aspects that constitute recognition and perception by algorithm: the statistical pattern recognition method of Principal Component Analysis (PCA), the production of facial aggregates called eigenvectors and the formation of the subspace called the face space. The eigenface method recognizes individual faces by differentiating them from a statistical average. The primary representational mechanism of eigenface, that is, the algorithm's means of coming to know and recognize faces, relies on a statistical meth-

od. Recognition through the eigenface method occurs through the merging of statistics with vision. This merging of statistics with vision as a means of recognition has various ontological implications. One of these was explored in this thesis in the discussion of the historical antecedent of the eigenface method: Galton's composite portraiture and his method of using statistical representations of faces to uncover sociological types. The discussion of Galton's approach to composite portraiture responded to the second research question of this study, on the historical continuities and discontinuities between AFR methods and their antecedents. With this account of Galton's composite-portrait practice, this study emphasized the cultural and historical context of the origins of a merging of statistics and vision, namely the way Galton's broader project of eugenics and the visualization of reductive, normative sociological categories inform a particular statistical way of seeing.

An alternative to this statistical way of seeing – and of interpreting the significance of the composite portrait – is provided by Ludwig Wittgenstein, who puts forward an alternative take on the meaning of the composite's aesthetic form. Approaching the composite portrait as an object of study within the field of philosophy and within his project of investigating language games, Wittgenstein argues that we should recognize that the composite portrait contains multiple overlapping forms. Rather than perceiving the composite as an expression of statistical reduction, he sees it as an expression of a perceptual fluidity. Through his concept of aspect perception, Wittgenstein describes a perceptual ability to perceive forms shifting into other forms. I argue that, in his approach to the composite portrait, Wittgenstein provides an inherently utopian vision that expresses the kind of fluidity found in current discourses of identity politics and the politics of representation, a vision that resists the reductive processes of recognition through AFR systems and their utilization of biopolitical control.

Wittgenstein's alternative take on the composite portrait was expanded upon in Part II, which explored the artistic engagements of contemporary artists with the technology of facial recognition. This brings us to the third and final research question of this study, which asked how contemporary artists have articulated and prob-

lematized the cultural implications of AFR technology. I discussed examples of contemporary artistic practice in order to provide further insight into the contexts of AFR implementation and suggest new ways of conceiving of this technology. Each artist presents an engagement with facial recognition technology within a particular cultural discourse, thus answering a central question posed by this technology: what meaning can be derived through a process of automated facial recognition?

The Composite Form

Throughout this study, the motif of the composite portrait has appeared in different forms. The composite emerges as an aesthetic form that is expressive of how information is structured. This investigation has shown that the composite form, as it has expressed itself in practices of facial recognition, has two diverging and contradictory meanings that are developed through two different discourses. In the analysis of eigenface, the digital composite was introduced as the phantom face that peers out from the eigenface image, as the visualization of a statistically constructed pattern of multiple faces. In Francis Galton's work, the composite portrait was deployed in the attempt to produce images of sociological types. Although ultimately failing in this endeavor, Galton's composite portraits were an original attempt to give visibility to a knowledge only possible and operational through statistics and to make this knowledge accessible to the human eye. The eigenface image and Galton's composite portrait are examples of the composite form being utilized within the areas of science and governance and operationalized as a predictive tool through reductive logic. But in Wittgenstein's perceptual approach to the composite portrait – now transplanted to the discourse of philosophy – it is an expression of multiplicity in which all the phenomena that make up the composite lie open to view.[5] The composite portrait is an expression of a relationship between varying forms. The possibilities of meaning

5 Wittgenstein, *Philosophical Investigations*, 126.

contained within the perception of the composite form also, on this view, multiply. This study concludes that the composite form can be expressive of an entirely different and contrary meaning from the one suggested by the reductive, statistical interpretation of the form.

This alternative approach to the composite form was further explored in Part II. Through a discussion of works by three artists, Thomas Ruff, Zach Blas and Trevor Paglen, I examined the varied expressions of the composite motif in contemporary artworks engaging with the theme of facial recognition. The artworks in this study extract the composite and the structures of AFR knowledge from the discourses of science and governance, and they explore the myriad representational uses of the composite. In Ruff's series of *andere Portraits*, silk-screened photographic composite mugshots explore the notion that the act of representation itself constructs an identity. The binary and analogue composite form used in this series of portraits is such that one's eyes are never able to rest on a single face. Like a kind of large-scale visualization of Wittgenstein's concept of aspect perception, these portraits express a constant fluidity – between faces and, also, between notions of gender. Blas's sculptural masks, in his *Facial Weaponization Suite*, transform composite portraiture into physical form. Blas's sculptural composites reference a notion of excess: that is, the multiplicity of facial forms that constitute his masks counter and resist the singularity of a recognition operation by an AFR system. A key contribution of Blas's work is his use of the form of the composite, that is, the aesthetic form that structures the information used by an AFR system, to counter the very operation of this technology. Drawing on discourses in post-colonial theory and theories of political agency, Blas uses his masks to reassert an unruliness in representations of the body. His work also points towards a notion of the subject *as* composite, through a political strategy of collectivism. Paglen's use of the composite form in two series, *Adversarial Hallucinations* and *Eigenface (Even the Dead Are Not Safe)*, appropriates the categories of knowledge used to train AI systems of recognition. By presenting algorithmic-based imagery, his composites reveal a relationship between training data and an algorithmic ability not only to recognize

but to reimagine physical form. Paglen's use of literary metaphors and ideological concepts to categorize training data speaks to the deeper truths that structure contemporary surveillance systems and offers a means of critiquing their cultural logic.

Through these alternative explorations of the composite form and facial recognition, these artworks reassert a visual field that is fluid, open, mutable and dynamic. As such, they are able to reveal the limitations of a machinic way of seeing and instead put forward a way of seeing that can measure up to the truth of the recognized subject. As Jenny Edkins states, "the contemporary face – the face of biopolitics and surveillance – forces a being into presence, but into presence as an object not a person. The being, in all its mystery, its unknowability, is missing."[6] As well as providing these expressions of an open, mutable perception, these artworks allow for a measure of *unknowability* in relation to the subject. This space allows a subject to choose her own identity or identities, based on an embodied, subjective experience, and also allows the subject to have the right to reject enforced, institutional categories of identity. This right continues in its importance because institutional identities are constructed by institutions of governance – the same institutions of governance that have historically deemed black and brown people sub-human, cast Jews as the enemy and today detain a growing population of migrants in detention camps, defining these groups as stateless and thereby without access to certain, inalienable rights.

Recommendations: Looking Forward

During the final stages of writing this book, the *New York Times* carried a news report about the first known use of AFR by a government for the purposes of racial profiling.[7] The report described the use of AI by authorities in China, in particular, the use of facial

6 Edkins, *Face Politics*, 7.

7 Paul Mozur, "One Month, 500,000 Face Scans: How China Is Using AI to Profile a Minority," *The New York Times*, April 14, 2019. https://www.nytimes.

recognition technology to surveil and track members of the Uighur community, a minority ethnic Muslim population, for the purposes of law enforcement.[8] The report explains that recognition is strictly based on appearance, as Uighurs look distinct from the majority Han population in China, which makes it "easier for software to single them out."[9] The report describes the creation by Chinese authorities of face-image databases not only for Uighurs but also "for people with criminal records, mental illnesses, records of drug use and those who petitioned the government over grievances."[10] In light of the historical analysis offered in this study, we may say that, with the use of AFR technology in China, history is repeating itself. My analysis of the facial representation mechanisms found within the eigenface algorithm and the practice of differentiating facial groups from a "norm" makes it clear that the possibility of using this technology for racial profiling purposes is built into the very ways of seeing that underlie AFR processes. The report on the use of AFR by the Chinese authorities also describes a shift in the development of AI technologies; where before democratic societies had the upper hand in this sector, authoritarian regimes are now producing a new generation of tech startups that cater to their needs.[11] This authoritarian use of AFR processes not only reflects one possible path of future development for this technology but also recalls a history in the discourses and practices of the politics of representation. In conclusion, this analysis recommends looking toward the aesthetic forms that structure algorithmic knowledge as sources of inquiry and contestation. In doing so, it has engaged with a historical discourse on the relationship between visual perception and knowledge, and it has sought to relate this to an alternative way in which technology might define and organize visual perception in the future.

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com/2019/04/14/technology/china-surveillance-artificial-intelligence-racial-profiling.html?partner=IFTTT.

8 Ibid.

9 Ibid.

10 Ibid.

11 Ibid.

This book began with a description of an experience I had of being biometrically registered at an airport border crossing, and it ends with this report of the first known use of AFR for racial profiling purposes. The growing use of AFR in a variety of areas, from risk mitigation and the control of people's movements and access to resources to the profiling of vulnerable groups, indicates an intensification of the interconnections between its automated processes and contemporary notions of recognition, representation and identity. It also indicates the necessity of approaching algorithmic processes as possible objects of critique, of problematizing their logic and dissecting and seeing through their everyday use. This means ensuring that the processes and narratives of algorithms – their weaknesses, their logic and their implications – are transparent to us. This analysis joins those of other scholars in the field of the humanities who have found it necessary, and *possible*, to question the logic of algorithms and to dissect their use. The issues that arise from the technological development of AI and the application of AFR reveal that contemporary shifts in technology go hand in hand with a shift in culture. In the face of our increasing dependence on AFR technology, this visual culture analysis of the phenomenon has, in sum, amounted to an academic version of an A.I model of always keeping the "human in the loop" – by keeping the *humanities* in the loop and recognizing that they are, almost always, already in the loop.