ALGORITHMIC ANXIETY IN CONTEMPORARY ART:

A KIERKEGAARDIAN INQUIRY INTO THE IMAGINARY OF POSSIBILITY

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INTRODUCTION: FROM ALGORITHMS TO ALGORITHMIC CULTURE

For a long time, artistic engagement with algorithms was marginal in contemporary art. Over the past eight years, however, a growing number of artists and critical practitioners have become engaged with algorithms, resulting in algorithmic theatre, bot art, and algorithmic media and performance art of various kinds, which thematize the dissemination and deployment of algorithms in everyday life. The numerous art exhibitions that have been curated over the past years in art institutions, at festivals, in galleries and at conferences — both large and small — in Europe, the Americas, Canada, and in China, reflect this rising prominence of algorithmic art. These exhibitions aim at imagining, representing and narrativizing aspects of what is called algorithmic culture: for instance, in exhibitions that address the modulation of behavior and algorithmic governance; shows on algorithmic capitalism and data surveillance; shows on self-quantification; as well as shows on information technology and cybernetic culture and human and machine relations in general. Indeed, one might say, in the spirit of Langdon Winner, that 'algorithm' is a word whose time has come. If theorists of media and technology are to be believed, we live in an 'algorithmic culture'.[1] [2] [3]

Algorithms sort, search, recommend, filter, recognize, prioritize, predict and decide on matters in a range of fields. They are embedded in high-frequency trading in the financial markets and in predicting crime rates through data profiling, for instance. They are deployed to analyze traffic, to detect autoimmune diseases, to recognize faces, and to detect copyright infringements. Mundane aspects of our lives, such as work, travel, play, consumption, dating, friendships, and shopping are also, in part, delegated to algorithms; they've come to play a role in the production of knowledge, in security systems, in the partners we choose, the news and information we receive (or not), the politicians we vote for, the jobs we get (or not). They also help automate routine jobs, and they are used in drone warfare, education evaluations, social services, and in numerous other fields. A time of ubiquitous algorithmic computing is 'firmly established', writes Rob Kitchin.[4]

Ted Striphas describes this developing algorithmic culture as a 'shift' which first began 30 years ago, as humans increasingly started to delegate 'the work of culture – the sorting, classifying and hierarchizing of people, places, objects and ideas – to computational processes'.[5] Aspects of everyday life are increasingly delegated to algorithms and accompanied by an algorithmic type of rationality.[6] 'The algorithmic', Paul Dourish observes, has become incorporated into broader and ongoing conversations about how our lives are shaped and

1   A. Galloway, *Gaming: Essays on Algorithmic Culture*, Minnesota: Minnesota University Press, 2006.
2   T. Striphas, 'Algorithmic Culture', *European Journal of Cultural Studies*, 18.4-5 (2015): 395-412.
3   P. Dourish, 'Algorithms and Their Others: Algorithmic Culture in Context', *Big Data & Society* (2016): https://doi.org/10.1177/2053951716665128.
4   R. Kitchin, 'Thinking Critically About and Researching Algorithms', *Information, Communication & Society*, 1 (2016), 14.
5   Striphas, 'Algorithmic Culture', 395.
6   E.g. O. Halpern, *Beautiful Data: A History of Vision and Reason Since 1945*, London: Duke Press, 2014.

organized.[7] Algorithms are part of mechanisms that privilege quantification, proceduralization and automation in human endeavors, Tarleton Gillespie argues.[8] Further, Taina Bucher contends that as everyday life increasingly takes place in and through an algorithmic media landscape, algorithms co-produce social life and political practices.[9] 'In ranking, classifying, sorting, predicting, and processing data, algorithms are political in that they help to make the world appear in certain ways rather than others'.[10] They do so, to an extent, in ways that are invisible to the human eye — an effect of, amongst other things, proprietary laws and regulations, computational scale, speed and complexity. This is why Gillespie argues algorithms remain outside human grasp, that there is something 'impenetrable' about their performance.[11] Their pervasiveness, the claim that algorithms shape our socio-technical world, the alleged 'merging of algorithms into the everyday', and the notion that they are 'taking decisions out of the hands of human actors' are all taken to be indicative of the ways algorithms have become a critical infrastructural element of contemporary life.[12] Like infrastructure, algorithms have become a key site and gatekeepers of power and power relations.[13]

Altogether, this has made for an intriguing art object — invisible yet omnipresent, proprietary yet pervasive, and with assumed socio-political powers that co-produce our lives — and a burgeoning field in contemporary art. The claim that algorithms shape, organize and co-produce everyday life, in ways that vary from the seemingly quotidian to the heavily politicized, has not only inspired artists, it has also given impetus to anxieties about the present and future of algorithmic culture in light of these developments. It seems 'the algorithmic' and 'algorithmic culture' have become shorthand for a nexus of concerns about the entanglement of the social and the algorithmic. Having visited numerous exhibitions thematizing algorithmic culture, what I have found striking is the high volume of artistic engagements with facial recognition algorithms, trading algorithms and search engine algorithms. It seems these types of algorithms have garnered more artistic responses than other types of algorithms. What is more, a limited number of artworks that engage explicitly with these three types of algorithms have been circulating widely; they have been included again and again and again in a wide range of thematized group exhibitions on different aspects of algorithmic culture throughout Europe, Canada, and the Americas. Some of the artists of these works received a great deal

7   Dourish, 'Algorithms and Their Others', 1.
8   Dourish, 'Algorithms and Their Others', 27.
9   T. Bucher, *If... Then: Algorithmic Power and Politics,* Oxford: Oxford University Press, 2018.
10   Bucher, *If... Then*, 3.
11   T. Gillespie, 'Algorithm', in *Digital Keywords: A Vocabulary of Information Society and Culture*, edited by B. Peters, Princeton: Princeton University Press, 2016, 26.
12   D. Beer, 'The Social Power of Algorithms', *Information, Communication & Society*, 1.20 (2017), 5.
13   E.g. Bucher, *If... Then*; J. Cheney-Lippold, *We Are Data: Algorithms and the Making of Our Digital Selves,* New York, NY: New York University Press, 2017; Kitchin, 'Thinking Critically About and Researching Algorithms'; C. O'Neil, *Weapons of Math Destruction: How Big Data Increases Inequality and Threatens Democracy,* Largo: Crown Books, 2016; N. Diakopolous, *Algorithmic Accountability Reporting: On the Investigation of Black Boxes*, New York, NY: Columbia Journalism School, Tow Center for Digital Journalism, 2014; M. Lenglet, 'Conflicting Codes and Codings: How Algorithmic Trading Is Reshaping Financial Regulation', *Theory, Culture & Society*, 28.6 (2011): 44-66; D. Beer, 'Power Through the Algorithm? Participatory Web Cultures and the Technological Unconscious', *New Media & Society*, 11.6 (2009): 985–1002.

of attention in the international press and have given numerous lectures at international art and digital culture conferences, festivals, and other public events. This attention on facial recognition algorithms, trading algorithms and search engine algorithms might not be surprising. After all, facial recognition algorithms, trading algorithms and search engine algorithms are associated with a range of concerns and uncertainties about the deployment, future developments, and possible implications of algorithms. Facial recognition algorithms are associated with repressive political regimes, with influencing people's personal decisions, with amplifying racism, sexism and homophobia, with deep fake videos, and with preempting political dissent. Trading algorithms are linked to the global financial crisis, volatility on the financial markets, and are said to undermine open societies and markets. Search algorithms are blamed for filter bubbles, the spread of fake news, and the corporatization of online information. Taken together, these three types of algorithms address significant supra-individual anxieties of this decade: socio-political uncertainty, the global economic crisis and ongoing recession, the centralization and financialization of access to online information, and political polarization and instability. However, what *underpins* of these anxieties and why these three types of algorithms form the subject of critique is rarely interrogated, less so when this criticism takes the form of artistic portrayals. This is one issue that I wish to address.

This renewed artistic attention to algorithms in general — and facial recognition algorithms, trading algorithms and search engine algorithms in particular — would not have surprised Marshall McLuhan, who wrote in *Understanding Media: The Extensions of Man* that reflections on new media technologies require the artistic eye: 'The serious artist is the only person able to encounter technology with impunity, just because he is an expert aware of the changes in sense perception'.[14] Such a statement might ring too Romantic for our time. I do not agree with his notion that *only* artists can understand the days and age we live in. However, there is a shortage of scholarship that relates algorithms to the broader artistic and cultural contexts in which they are embedded. Reflections on algorithmic culture require materializing what is, mostly, invisible, and this is done, *in part*, by artists from various perspectives and disciplines. What is lacking is an analysis of how the algorithm is *imagined*, represented, and narrativized by artists, which can also be understood as an effect of algorithms in and of itself. Artworks are sites of meaning on which ideas and stories about algorithms are circulated, stretched, organized, and shaped. Therefore, I use prominent artistic representations of facial recognition algorithms, trading algorithms and search algorithms as the entry point into an exploration of the constituents of the anxieties braided around these algorithms.

Focusing on the artistic portrayals of algorithmic entanglements takes us away from questions revolving around what, when, and where algorithms *are*. While acknowledging that technical details about algorithms are important, I aim to respond to the idea that algorithms 'do' things beyond their technical capabilities. There is nothing novel about algorithms — depending on one's definition, they can be traced back to Babylonian times. The question we must therefore ask is why algorithms arise *now* as objects of concern, not just for artists but for academics and numerous commentators in a variety of fields. Should we see them as synonymous with

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14   M. McLuhan, *Understanding Media: The Extensions of Man,* edited by W. Terrence Gordon, Berkeley: Gingko Press, 2003, 31.

the anxieties about Big Tech? What is the object of concern, the input or the output of algorithms? And which came first: the data or the algorithm? If data and algorithms are mutually dependent, can we analyze them separately? Should we perhaps write a typology of all existing types of algorithms, down to the technical minutiae of lines of computer code? Do we need to study their formal automation structures, or rather the mathematical formulae with which they calculate? Should we instead study the instructions for navigation, the parameters, the encoded procedures that transform input data into output data? Or should we study the entire software ecology that supports them? Should we historicize the algorithm and situate it within the persistent modernist desire for mechanization and automation? Are algorithms agents, objects or artefacts, or merely automated statistics? Particular algorithms often operate as part of a collection of algorithms that are part of networked systems, which raises the question: *Where* is 'the algorithm'? Plus, algorithms are constantly tweaked and honed, and thus constantly change. Thus: *When* is 'the algorithm'? Put simply: 'the algorithm' is more than the sum of its parts, it stands for more than its technical capabilities. As David Beer puts it:

> The algorithm is now a cultural presence, perhaps even an iconic cultural presence, not just because of what they can do but also because of what the notion of the algorithm is used to project. [W]e need to develop an analysis of the cultural prominence of the notion of the algorithm, what this stands for.[15]

These questions inform the investigation of algorithms in this book. Nevertheless, the approach to algorithms it will take is slightly different or perhaps even unexpected.

Outstanding work on aspects of algorithmic culture has been done over the years. Drawing on software studies, philosophy of technology, ethics, media studies, race and gender studies, decolonial studies, STS, and social sciences, thorough critical research has been conducted on algorithmic culture from a wide variety of disciplines.[16] However, one crucial aspect of algorithmic culture that has yet to be studied by scholars working in these fields is the anxieties that underpin the cultural prominence of algorithms. This aspect of the algorithm is a recurrent theme of commentary on these computational processes. It is also central to our experience of algorithmic culture. It therefore merits closer reading. My investigation of the algorithm will focus on the anxieties that undergird our relation to them. To analyze the anxieties that surround algorithms, I propose that the work of Søren Kierkegaard — one of the first theorists of anxiety — can help us to investigate and to analyze different anxieties about algorithmic

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15   Beer, 'The Social Power of Algorithms', 11.
16   E.g. A. Mackenzie, *Cutting Code: Software and Sociality*, New York: Peter Lang, 2006; L. Nakamura, 'The Socioalgorithmics of Race: Sorting It Out in Jihad Worlds', *The New Media of Surveillance*, edited by Kelly Gates and Shoshana Magnet, New York, NY: Routledge, 2009; S. Browne, 'Digital Epidermalization: Race, Identity and Biometrics', *Critical Sociology,* 36.1 (2010); Diakopoulos, 'Algorithmic Accountability Reporting'; M.B.N. Hansen, *Feed-Forward: On the Future of Twenty-First-Century Media*, Chicago: University of Chicago Press, 2015; Kitchin, 'Thinking Critically About and Researching Algorithms'; O'Neil, *Weapons of Math Destruction*; Cheney-Lippold, *We Are Data*; R. Richardson, J. Schultz, and K. Crawford, 'Dirty Data, Bad Predictions: How Civil Rights Violations Impact Police Data, Predictive Policing Systems, and Justice', *New York University Law Review Online*, 2019, https://www.nyulawreview.org/online-features/dirty-data-bad-predictions-how-civil-rights-violations-impact-police-data-predictive-policing-systems-and-justice/.

culture critically. Much has been written on Kierkegaard's conception of anxiety, but it has not been applied to anxieties around algorithmic culture. Doing so obviously brings his work into a context that it could not have anticipated, yet one in which it will be useful nonetheless.

In *The Concept of Anxiety*, Kierkegaard argues that anxiety, different from fear, has no object and no determinate character.[17] When one feels anxious, one's anxiety is caused by nothing in particular or a 'not-yet' of unknown character. Anxiety is a term for a concept, an experience and a response to events and phenomena that are not knowable, not fully graspable, ambiguous or vague. One is not anxious about 'persons' or 'finitudes', Kierkegaard explains.[18] One is also not anxious about yesterday either because anxiety is future-oriented. Though it may be felt in the here and now, in your body, anxiety points to the future, to the not yet and the yonder. We are anxious about possible future events and phenomena that we cannot anticipate, know, or predict. It is the radical openness of the future or, put another way, the inability to fully comprehend or know the future, which conditions anxiety.

This radical openness of the future is what Kierkegaard calls possibility or the possible. Kierkegaard writes that when anxiety seizes, one is seized by the possible. The possible is about future possibility — a condition that is not. Therefore, he argues, possibility — and, counterintuitively, not *im*possibility — 'is the most difficult of all categories'.[19] He writes: 'In possibility all things are equally possible and anyone truly brought up by possibility has grasped the terrifying just as well as the smiling.'[20] Everything is possible within the possible, and 'everything' includes the unthinkable, unknowable and unimaginable. If everything were not possible, there would be no possibility, and the future would then be to a great extent calculable, predictable, probable, which does not mean that people do not try to predict the future or aim to reduce risks with the help of calculations and probabilities. However, that does not change anything about the fundamental openness of the future, according to Kierkegaard, as '[a]nxiety is freedom's possibility'.[21] Without possibility there would be no anxiety, because 'anxiety is freedom's actuality as the possibility of possibility'.[22] Anxiety is about what is possible, and what is possible is fundamentally unknown to mortals. Further, 'learning to be anxious' means to not avoid it altogether nor being ruined by it, but to learn to 'live through' it.[23] Importantly, it entails being aware 'that absolutely nothing can be demanded of life, and that horror, perdition, and annihilation live next door to every human being'.[24] It

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17   S. Kierkegaard, *The Concept of Anxiety: A Simple Psychologically Oriented Deliberation in View of The Dogmatic Problem of Hereditary Sin*, edited and translated by A. Hannay, New York, NY: Liveright Publishing Company, 2014(1844).

18   S. Kierkegaard, *The Concept of Anxiety*, 259.

19   S. Kierkegaard, *The Concept of Anxiety*, 257.

20   S. Kierkegaard, *The Concept of Anxiety*, 257.

21   S. Kierkegaard, *The Concept of Anxiety*, 256.

22   S. Kierkegaard, *The Concept of Anxiety*, 86.

23   S. Kierkegaard, *The Concept of Anxiety*, 255.

24   S. Kierkegaard, *The Concept of Anxiety*, 257. Kierkegaard experienced much suffering. By the time he was 21 years of age, he had lost his mother and five of his six siblings. His father would die a few years later. He also suffered from a spinal disease, epilepsy, and from what was then called melancholia.

has to do with the vague awareness that sudden 'cataclysmic events' are as much a part of life as the moments of serenity and joy.[25]

Further, for Kierkegaard anxiety is both an ontological and epistemological concept. In *The Concept of Anxiety*, he argues that all epistemology is rooted in anxiety and those moments of anxiety are fundamental to human existence. Importantly, anxiety is not merely a personal feeling; it is grounded in the social, Kierkegaard explains in *The Present Age: On the Death of Rebellion*.[26] Referring to Kierkegaard, and writing on anxiety, Sianne Ngai explains this connection between anxiety, ontology and epistemology in *Ugly Feelings* as follows:

> [T]here is an indissociable relation between affect and concept in which every cognitive structure is said to presuppose a mood — so much so that an error in the modulation becomes just as disturbing as an error in the development of thought.[27]

Anxiety is also a social emotion. Ngai explains:

> [F]eelings are fundamentally 'social' as the institutions and collective practices that have been the more traditional objects of criticism (as Raymond Williams was perhaps the earliest to argue in his analyses of 'structures of feelings') […] and "infra-structural" in its effects.[28]

Understood this way, anxiety gives shape to the ways in which the entanglement of the social and the algorithmic is conceived, while this entanglement also harbors beliefs and structures of feeling and understanding. It pertains to possible future forms of being, presence and knowledge in entanglement with algorithms that are uncertain or unknown to us. The prominent artistic engagements I focus on are emblematic of ways of perceiving the entanglement with algorithms that can be described as structured by anxiety. What I will call 'algorithmic anxiety' refers to the ways in which anxiety — as both an ontological and epistemic concept — is shaped by anxieties about the future of algorithmic culture, which shapes perceptions of algorithms in the present and which, in turn, is reflected in prominent contemporary artworks that address specific practices of facial recognition, trading algorithms and search algorithms.

Of course, one might argue that the anxiety around algorithms, in general, is the umpteenth version of the age-old trope of the fear of what Langdon Winner called autonomous technology. Another might claim that algorithmic anxiety is nothing more than a reassertion of a type of Romantic humanism which arises as a result of socio-technical developments that put pressure on the boundaries of a particular symbolic order. Indeed, anxiety about algorithms seems to be synonymous with the anxiety about the totality of information technology, with networks of ultra-speed data travelling and the management of its protocols by state institu-

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25 M. Ruefle, *Madness, Rack, and Honey,* Seattle and New York: Wave Books, 2012, 112.
26 S. Kierkegaard, *The Present Age: On the Death of Rebellion*, translated by A. Dru, New York and London: Harper Perennial, 2010(1846).
27 S. Ngai, *Ugly Feelings,* Cambridge: Harvard University Press, 2005, 228.
28 Ngai, *Ugly Feelings*, 25.

tions and for-profit corporations. Some could argue that anxiety around algorithms is part of the anxiety about the 'societies of control'[29] or 'control societies'[30]. Furthermore, others might say algorithms are imbued in histories of war-time machinery and colonialism, which intersect with mechanisms of bureaucratization and the management and control of human endeavors, as well as with the long histories of statistics, accounting, and quantification. This might be true, in part or in whole; I do not mean to argue against this. However, to acknowledge these claims does not address the question of why specific aspects and implementations of algorithms are at the forefront of critique rather than others. More specifically, it leaves open how specific algorithms are imagined such that they are generative of different anxieties that seem to reach far beyond their specific and respective technological capabilities. Facial recognition algorithms trigger different anxieties than search algorithms, which trigger different anxieties than trading algorithms, which trigger different anxieties than facial recognition and search algorithms.

This leads me to the central question that structures this book: What anxieties are interwoven with algorithms as represented within prominent art practices and how is the possible constituted therein?

The concept of algorithmic anxiety will be developed in the following chapters. To flesh out this concept, I use what is called a 'concept-based methodology' to read prominent artistic engagements with facial recognition, trading algorithms and search algorithms alongside Kierkegaard's conception of anxiety.[31] Algorithmic anxiety builds on Kierkegaard's conception of anxiety, yet, by using it to think contemporary algorithmic culture, inevitably also moves beyond it. I do not use Kierkegaard's conception of anxiety as a looking glass through which artworks are analyzed or explained. Rather than presupposing what algorithmic anxiety might be, I will develop a concept of algorithmic anxiety through its engagements with artworks that engage with algorithms and the interplay between these artworks and Kierkegaard's conception of anxiety. In order to think further about its implications in today's algorithmic culture, concepts from the fields of philosophy, science and technology studies, algorithmic studies, comparative literature, as well as from cultural studies and media studies, will be put into dialogue with concepts and motifs present in the artworks. This concept-based method helps to understand why specific types of algorithms inspire anxiety more than others, and how algorithms gain meaning beyond their input and output, the code they run on, the data they process, or the specific corporate and technical infrastructural contexts in which they operate. I aim to contribute to discussions about how the entanglement of the social and the algorithmic is perceived, in different instances and from different perspectives, such that it evokes anxiety.

Chapter 1 comprises the conceptual framework of this book. I first introduce key anxieties discussed in academic studies on the entanglement of humans with facial recognition, trad-

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29   G. Deleuze, 'Postscript on the Societies of Control', *October*, 59 (1992): 3-7.

30   A. Galloway, *Protocol: How Control Exists After Decentralization*, Cambridge, MA: The MIT Press, 2004.

31   M. Bal, *Travelling Concepts in the Humanities: A Rough Guide,* Toronto: University of Toronto Press, 2002.

ing algorithms and search algorithms. I then move on to Kierkegaard's conception of anxiety. Since I aim to contribute to a better understanding of the underpinning of the anxieties about specific types of algorithms, the first question I want to raise is: What does it mean to speak of anxiety in Kierkegaard's conception of the term? Chapter 1 provides an outline of Kierkegaard's account of anxiety and, specifically, how it is conceptualized in relation to his other vital concepts that inform his work on anxiety: the self, faith, knowledge and the possible. Chapter 1 closes with a preliminary sketch of the concept of algorithmic anxiety.

After this preliminary sketch of some of the critical constituents of algorithmic anxiety, the subsequent Chapters 2, 3 and 4 are each organized around an artistic portrayal of a particular algorithmic process: facial recognition, trading and search algorithms, respectively. Algorithmic anxiety in contemporary art takes different forms. In one more dominant trend, artists reflect on how algorithmic culture affects conceptions of self and values like freedom, transparency, autonomy, or objectivity. Other artists seek to materialize the alleged immateriality of trading algorithms. Some mock the trust in algorithmic computing; others soak it up. Yet others deploy algorithms to specific political ends to criticize the rationality behind some of their features. Each of these artistic portrayals of algorithms performs and produces different anxieties. Each of these chapters is framed by a close reading of a number of these artworks. I develop the concept of algorithmic anxiety through a close reading of the recurring motifs and concepts in particular artistic imaginaries, drawing on masks and camouflage (Chapter 2); hybrids and specters (Chapter 3); and collectors and collections (Chapter 4). Artists design face masks and camouflage wear, evoke specters and hybrids, and imagine infinite collections to narrativize and imagine the evolving and ambiguous phenomena of 'the algorithmic'. The inherent ambiguity of the range of concepts and motifs that I engage with is part of the dynamic of algorithmic anxiety that I will contextualize and conceptualize.

It has to be noted that the artworks I have selected for analysis are preponderantly made by Western artists who have received a great deal of critical attention and who have been exhibited repeatedly in art exhibitions about algorithmic culture primarily — but not exclusively — in Western Europe and the U.S. This focus on Western artists in Western exhibitions is for reasons of access: over the past seven years, I have visited numerous exhibitions on algorithmic culture, mainly in Western Europe and in the U.S., that reflected an anxiety that one could also find in popular and mainstream Western media reports — written in languages I can read — on the developments of algorithmic culture. That said, the examples covered provide a thorough cross-section of contemporary art about algorithms.

Chapter 2 explores mask and camouflage wear designed by artists in an attempt to thwart off and criticize facial recognition algorithms. It focuses on Zach Blas's *Facial Weaponization Suite* (2012), Adam Harvey's *HyperFace* (2017), and Sterling Crispin's *Data-Masks* (2014), offering a reading of these prominent artworks in relation to Kierkegaard's conception of the self as a synthesis between the finite and the infinite. The algorithmic capture of the face causes anxiety partly because of the powerful capabilities with which facial recognition technology is associated. In this chapter, I explore how the self is performed in these mask and camouflage works and how a Kierkegaardian conception of the self presents a play with relations between self, environment and the algorithmic medium of capture. Combined with

a Kierkegaardian notion of the self as a relational synthesis, masks and camouflage show the possibilities inherent in emphasizing different forms of being and relating — such as inter-dependency, community, collaboration, and collectivity — which may defy anxieties evoked by facial recognition technology.

Chapter 3 centers on the close reading of prominent artworks that engage with trading algorithms. Algorithmic trading causes anxiety in part because the infrastructure of trading algorithms is conceived as an invisible and impenetrable black box, impervious to change. This chapter uses Rita Felski's concepts of 'digging down' and 'standing back' to distinguish between two popular artistic approaches to trading algorithms. Artists that 'stand back' visu-alize aspects of the infrastructure of the black box of finance, such as server racks, cables of different kinds, and market index graphs. This rendering visible of supposedly invisible aspects of the black box of finance is perceived as a key to grasp and open it. The second approach is characterized by artists that in various ways tinker with or reenact the inner work-ings of aspects algorithmic trading. Both tend to focus on, and add emphasis to, a limited set of infrastructural aspects of algorithmic trading. This is followed by an analysis of a third approach which focuses on a spectral imaginary of trading algorithms, exemplified in this chapter by Emma Charles' experimental video artwork, *Fragments on Machines* (2013), and Femke Herregraven's work *Pull everything, pull everything* (2018). Their spectral imaginary of trading algorithms focuses on the broader relational context within which algorithmic trading is embedded. What is more, their spectral representations allude to subversive and possibly catastrophic events under which change becomes possible. To unpack the relation between catastrophe and change, I read these artworks alongside Kierkegaard's notion of the possible.

Chapter 4 engages with the anxieties that Google's search engine evokes. This chapter focus-es on Google primarily because it is the most used search engine, at least in Europe and the U.S.: this service evokes anxiety about the abuse of aggregated data and the for-profit logic behind the algorithmically ranking and listing of search results. In response, artists have created alternative search engines, or perform or ridicule specific features of Google's search engine. Another recurring motif in artistic representations of web searches is the act of collecting or the formation of a collection. Camille Henrot's experimental film *Grosse Fatigue* (2013) frames web search as a form of collecting and refers to Walter Benjamin's conceptualization of the collector. When read alongside Kierkegaard's notion of the relation between faith and knowledge, I argue that *Grosse Fatigue* offers a repositioning, a different relation, to the pervading discourse on the centralised, monetized and monopolized structures of Google's search engine. Further, by adopting a Kierkegaardian understanding of the act of collecting as a passionate act, I argue that we can develop a way out of search anxiety by moving towards what exceeds it.

In the final chapter I draw the preceding analyses together. I offer explanations as to why specific algorithms trigger algorithmic anxiety, and it provides reflections on how to live through it. The central Kierkegaardian concept of this chapter, which ties together the concepts dis-cussed in the previous chapters, is 'movement at the spot'. Movement at the spot is a way to relate to possibility, and it will be framed as a productive form of living through algorithmic anxiety. To move at the spot is to make room for alternative imaginations and possibilities in

order to live with and through algorithmic anxiety. In this chapter, the alternative imaginations of masks and camouflage (Chapter 2), hybrids and specters (Chapter 3), collectors and collections (Chapter 4) will be framed as figures of movement at the spot. These figures of motion show that the algorithmic structures we inhabit and that inhibit us can be opened by moving beyond the limitations detected by algorithms. They point to the many contradictory relations within algorithmic culture and represent different ways to relate to possibility, in order to live through algorithmic anxiety.