

DIGITAL AFTERCARES

DIGITAL RETOOLING FOR AGENCY, VALUE, AND CO-VULNERABILITY AS ARTISTIC PRACTICE

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DECLARATION

This thesis represents partial submission for the degree of Doctor of Philosophy at the Royal College of Art. I confirm that the work presented here is my own. Where information has been derived from other sources, I confirm that this has been indicated in the research project.

During the period of registered study in which this research project was prepared the author has not been registered for any other academic award or qualification. The material included in this research project has not been submitted wholly or in part for any academic award or qualification other than that for which it is now submitted.

A handwritten signature in black ink, consisting of a large, stylized 'C' followed by a series of loops and a long horizontal stroke ending in a small dot.

September 22, 2022

To my caring and careful readers, without whom this thesis would not be possible: Isobel Harbison, Dave Beech, John Slyce, Melanie Jackson, and Hazem Jamjoum. To my collaborators whose contributions generated great work and discussions: Shira Wachsmann, Ama BE, Dario Srbic, and Grace Quantock. With deep gratitude to the Terra Carta Design Lab and InnovationRCA for recognition and support of Or:ital Bloom. Thank you to Edo Konrad, Gemma Blackshaw, Sharon Kivland, Rob Horning, Lula Criado, and Meritxell Rosell for publishing my work relevant to this thesis. And to all who have encouraged and supported me during this time, namely, Christina Makris, Layla Maghribi, Joshua Dell, Maya Parker, and, last but not least, my Parents.

Abstract

This practice-based thesis develops digital retooling as an artistic methodology that ties together socially engaged practice, speculative design, and digital arts to create original artworks and projects that rescript how dominant digital media functions. Digital retooling is a propositional, practical, creative, and critical method that transforms existing technologies through artistic practice to break from hegemonic structures rooted in digital capitalism and data colonialism. Staying with embodiment and vulnerability, my research and practice centers architectures of agency, care, and community in overwhelmingly nonconsensual and traumatic digital systems.

As a practice-based methodology, digital retooling moves beyond image and interface to emphasise infrastructure, contextuality, and the processes by which media acquires meaning and form as it moves in the world. The artistic projects I develop in tandem with critical research innovate at the visual, infrastructural, and social layers to contest default modes and plug-and-play forms of exploitation that come loaded into dominant digital media systems. Through speculative hacking, backend redesign, and an expanded trauma-sensitive approach, my research develops digital retooling as an artistic methodology that integrates speculative, decolonial, and care-based approaches.

Drawing on post-colonial, decolonial, and critical race media studies, my art projects stress local contingencies against the grain of universalist computing and the alleged neutrality of digital systems. To understand digital media as a multi-layered affectual, psychological, social, and financial medium my research comingles situated self-awareness as a digital user with an analysis of the medium's structural, economic, and political layers. In this thesis, I refer to and make use of the multi-layer entanglements brought to bear by digital technologies as 'nested intimacies' and 'strangely intimate digital assets'.

For this PhD, my practice incorporates diagrams, writing, talks, performance, and digital art and wearables. This thesis presents four art projects: 'Bath Motes: Liquid architecture for Pain Relief' which proposes a fantastical product for technologically

mediated self-care; 'Black Body Radiation: Rescripting Data Bodies' a collaborative work that retools body sensor networks and blockchain architectures to consider value in performance artworks and in relation to colonial legacies and practice; 'Virtual Keffiyeh' which encompasses critical research, advocacy and a digital wearable to draw attention to Palestinian digital rights in metaverse and virtual spaces; and 'Or:bita! Bloom'—a start-up that recycles environmental performance data into digital artworks that express transitions to sustainability and net zero.

The research and artistic interventions I present in this thesis are concerned with lived experience, critical research, interfacial and infrastructural design in digital and hybrid worlds with the aim of creating new spaces for 'digital aftercares'. 'Digital aftercares' suggest both speculative aftermaths beyond dominant and traumatic digital systems as well as the discovery of new modes of care in emergent mediascapes and infrastructures. This PhD serves as an example of and provocation to radically retool dominant digital media through artistic practice, recovering relationality, agency, and co-vulnerability through the digital arts.

Research questions

Together, my art practice and written research address the following questions:

-How can I use digital retooling as an artistic strategy to create interventions around agency, value, and community in digital media systems that break away from universalising and exploitative digital infrastructures?

-How can I develop and apply methodologies of digital retooling to initiate new imaginaries, projects, and frameworks that contribute to artistic creation and knowledge at the intersection of digital arts, socially engaged practice, and speculative digital design?

Keywords: digital retooling, agency, care, value, co-vulnerability, co-immunity, speculative hacking, backend redesign, trauma-informed approaches

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INTRODUCTION: QUOTIDIAN TRIGGERS

Quotidian triggers

As an artist working in digital media, riding out pandemic-accelerated waves of digitalisation has meant reorienting my practice in an increasingly computerised and datafied world. Global communication systems create new points of contact between human and nonhuman agencies, developing strange new intimacies between micro and macro structures, the close and distant, the affectual and quantifiable. Digitally mediated vectors connect bodies and data, affects and capital, actions and transactions in ways that are both highly abstract and embodied as they play out in the lives of individual users.

Like everyone around me, my academic, social, and personal life migrated to an endlessly shifting topology of personalised digital space. A meme popular during quarantine featured an identical, repeated image of a figure in front of a computer screen captioned 'dating', 'working', 'socialising' etc. For me, this would include research, therapy, and communicating with my family in Beirut during a time of unprecedented shocks and hardship.

As a digital user with C-PTSD, increased screen time brought new negotiations with disassociation, embodiment, and re-embodiment in digital spaces. Ambiguated consent, shadowy third parties, and a lack of clear choice points are commonplace in the digital environment but can also be sources of stress for users with higher trauma loads or information processing differences. These quotidian triggers have served as prompts for developing my research and practice along critical lines that refute the so-called neutrality and one-size-fits-all approach of technological systems while searching for alternative ways of creating artwork in a digital environment.

My research has largely been a work of care which means staying with vulnerability, discomfort, and seeing how my own situated engagement with digital technologies might bring new lines of questioning or methods into my practice. An ethics of care is concerned with knowledge production that is intimate, proximal, situated, and transformative. As María Puig de la Bellacasa writes, "questions about the politics of

knowledge in technoscience increasingly delve into ethical concerns raised by our proximity and involvement with the material effects of our thoughts.”¹ In my work, this entails both looking inwards at emotional and affectual entanglements with digital technologies as well as building a critical knowledge base around digital economies, infrastructures, and emerging technologies.

The digitalisation of daily life and ceaselessness of online media has pushed me to find healthier and more productive ways of existing in digitalised worlds. In my work and research, this has led to a clearer and more critical involvement with the social, historical, and economic dimensions of information technologies. My readings have grounded me in the interplay of image, affect, and data in what Jonathan Beller calls “computational capital” or the submerged discriminatory tech that Ruha Benjamin describes as allowing “racist habits and logics to enter through the backdoor of tech design, in which the humans who create the algorithms are hidden from view.”²

During this study, my practice shifted away from only employing digital technologies straight out of the box (such as using Adobe suite or promoting my work on Instagram) towards a more radical, personal, and speculative retooling of digital media technologies. This shift in my thinking and practice required a reappraisal of the politics of the visible and invisible in digital media systems. By moving beyond the interfacial, I was able to resituate my practice in horizontal relation to the technological and technical, and not simply on top of or astride it. As a critical researcher and artist this meant developing new methodologies to rescript both the interfacial elements and backend of technical processes. I developed digital retooling through research and practice, in response to frustration with superficial engagement with digital technologies, and to make backend processes more legible, tangible, and designable through art making.

In addition to rendering the invisible in digital media visible or tangible, my methodologies are informed by recalibrating digital technologies in relation to care, community, and value creation. My reading on trauma, care, digital economies, and value has enabled me to gather sufficient breadth to consider the ontological enmeshments, economic agendas, and technical scripts that contribute to globally scaled communication systems. As these are guided by my own experiences as a digital user with C-PTSD, my

research and practice is directed towards rescripting relationalities between human and nonhuman agents in digital systems in ways that can render them nonviolative, centering self-differentiation and the reclamation of agency, and recalibrating existing technologies to contribute to greater co-vulnerabilities. That said, my work is a response to hegemonic structures of the larger digital technosphere which continues to permeate all areas of life. My work does not claim to resolve these tensions but to open a domain where these pressures and contradictions become productive in my own practice.

In drawing from my own experiences with digital media, I am not implying that digitalisation is experienced as one thing or to flatten the incredibly complex and ambiguous ways that technologies become scripted into daily life. This ambiguous complexity rings true in my own life as digital media is the field where I choose to locate my practice and address much of my writing and research. It also connects me to countless loved ones and elsewhere. Digitalisation creates new sources of stress while simultaneously opening new possibilities for digital participation and accessibility. For users compelled to stay at home because of illness, disability, or personal preference, the digitalisation of daily life opens new areas of horizontality between virtual and real-life interactions. For global digital workers, programmers, and freelancers, digitalisation means the ability to access and compete in worldwide digital markets. These developments, however, render such issues as digital inclusion, digital rights, and individual agency even more paramount.

While my research and practice are anchored in my situatedness as a digital user, I try not to generalise from my position but to use these experiences to anchor investigations in an abstract and immense domain. My research draws on postcolonial computing which emphasises local contingencies against universalised outcomes and avoids tech-deterministic outlooks. Taking this into account, I consider my psychological and affectual responses to digital media as extremely local contingencies that add value to my research and practice.

The work I am submitting for this PhD demonstrates my new positioning as an artist working with digital media, stepping back from interfacial and discursive work towards an engagement with less visible and more violative substrates of information technologies.

Over the course of this study, I have intensified my involvement with the infrastructural elements of digital art making, to reach beyond bifurcations of the visible and invisible and evolve more integrative approaches to digital media practice.

My practice has grown over the course of this study to include digital artworks, writing, diagramming, collaboration, and co-founding a creative start-up around sustainability. In addition, my journey through this PhD study has resulted in the publication of several articles and essays that are relevant to the themes of this research. This includes: 'The occupation enters the Metaverse' on the advent of the metaverse and digital excursion in Palestine/Israel, which informs my artistic intervention for 'Virtual Keffiyeh'³; my piece on the decentralized web's reliance on viral media and inability to produce post-viral alternatives⁴; and my investigations of co-authorship and informational labor in relation to memes.⁵ These articles reflect my growing understanding of the political and economic dimensions of digital media, as well as a way to build communities online and get my voice out in a digital format that I find comfortable.

Taken together, these approaches recalibrate agency, care, and value in digital media practice. My practice and research converge around a shared project of understanding and shaping interventions at the visual and infrastructural layers of digital media, changing hierarchies of visibility and value, as well as renegotiating my position as a digital artist and user in these systems.

Overview of chapters

The work I am submitting for this thesis uses artistic strategies to retool existing digital technologies and frameworks. My research supports my artistic practice as process-based work, reflecting interlinking methods, decisions, and ethical considerations. The pathways that lead into my current methodology and practice are multiple and progressive, not linear or doctrinaire. My chapters present my perspectival and artistic journey over this period of PhD study leading towards an integrative digital arts and social practice. Therefore, this text serves as both a palimpsest of my evolving modes, ways of

being, and negotiations with digital media, from 2018 into the present, while articulating the development and applications of my methodologies and practice.

The intertwined development of my practice and research is discussed for each art project, including the application of key terms and structuring concerns from my digital retooling methodology. Each project is presented in a separate section with relevant documentation and concludes with a testing of my digital retooling methodologies as it applies to each project

My first chapter outlines the development of digital retooling methodologies with a view of how these methods and concerns interact across my research and practice. I introduce my digital retooling frameworks for recalibrating my artistic practice against digital media's default assumptions, violative practices, and universalising tendencies. I then present my collaborative work 'Black Body Radiation: Rescripting Data Bodies' with performance artist Ama BE, which retools body sensor networks and blockchain architectures to interact with the performer's body and metrics. The chapter ends with a discussion of consent in system architectures and value in digital creation, as well as the creation of 'strangely intimate digital assets'.

In the second chapter I combine insights drawn from auto-ethnographic writing on trauma, an ethics of care, and critical research to renegotiate my position in digital media's violative and ambiguating choice architectures. This chapter includes the first work I made using methodologies of speculative rehacking, 'Bath Motes: Liquid architecture for Pain Relief', which both proposes and lampoons a product for technologically mediated pain relief. I discuss 'nested intimacies' as entanglements of body and data, and my expanded take on trauma-sensitive approaches in digital and digitalised worlds. I consider undoings between bodies and environments in digital mediascapes as well as the possibility of traumatic breaches in posthuman or postbiological thresholds. I summarise my interview with Grace Quantock, a psychotherapist and researcher on trauma-informed approaches to digital media (appendix). My discussion with Grace informs 'strangely intimate diagrams', at the end of chapter two, which attempt to position and rescript my work as a digital media artist in relation to the larger digital techno-sphere.

The interventions I introduce in the third chapter emphasise care, agency, and co-vulnerability across two art projects: my designs for a digital wearable ‘Virtual Keffiyeh’ and accompanying research project— created in tandem with my article on the advent of virtual apartheid in Palestine and Israel⁶— and ‘Or:bital Bloom’ a sustainability start-up which recycles corporate sustainability data into digital artworks. The chapter ends with reflections on my changing role as an artist across my practice, the relationship of my work to the attention and image-based economy, and final thoughts on digital aftercares as emergent forms of care in digital systems.

CHAPTER 1: DIGITAL RETOOLING

Methodologies

This thesis explores digital retooling methodologies that contribute to artistic creation and knowledge production at the intersection of digital arts, socially engaged practice, and speculative design. My practice-based research develops artistic frameworks and projects that use retooling as an expansive methodology that critically engages digital media across multiple strata to radically recalibrate care, agency, value, and community as a mode of resisting dominant media practices. Digital retooling in my practice and research entails building broad knowledge bases and situated understandings with the aim of composing deliberate artistic interventions that unfold through interface and infrastructure, crosscutting the medium's colonial, economic, social, and personal layers.

My methodologies take cues from media scholar Ruha Benjamin's analysis of the social dimensions of technology informed by critical race studies; in particular, rethinking technological practice to resist discriminatory design and embed new values and social relations by "retooling solidarity."⁷ For Benjamin, retooling solidarity forms part of an expanded political and social project to contest the so-called neutrality of digital systems, codes, and design and reimagine an "emancipatory approach to technology" that couples "critique with creative alternatives that bring to life liberating and joyful ways of living in and organising our world."⁸

Retooling, in a broader sense, means to adapt or form new tools, reorganise, revise, or to modify.⁹ A Google search of 'digital retooling' shows the term is most commonly used to refer to factories or analogue processes which are becoming digitalised. In this thesis, 'digital retooling' refers to a convergence of practice-based methods and critical research through which I recalibrate my digital artistic practice at both the front and backend to create original artistic interventions, frameworks, and projects.

Digital retooling is a set of dynamic methodologies that I have developed through this PhD to reconfigure my artistic practice across critical, aesthetic, and political lines. I take a porous, broad, integrative, and multi-layered approach to develop digital retooling

as a methodology, that combines artistic practice, theoretical research, and auto-ethnographic reflection. My research on trauma, care, digital economies, postcolonial and decolonial computing, and post-capitalist value theory, demonstrates a wide focus, yet these flows comingle in daily life and in encounters with digital media. It is also within the purview of my artistic practice to find connections and points of contact between disparate disciplines and to create knowledge and artworks from these convergences.

My process-based approaches to art making deploy several strategies which comprise a dynamic methodology that aims to address my experiences as a digital media user as well as connect these to wider systemic injustices. My practice-based methodologies includes writing, diagramming, video editing, digital design, speculative hacking, collaboration, and interviewing. Through these connected modalities and processes, I have developed digital retooling to challenge digital inequalities, violative plug-and-play systems, and discriminatory tech, while keeping true to my own situatedness, informed by C-PTSD, as a Palestinian-Iraqi American living in London.

Structuring concerns and key phrases

My research combines practice-based insights and critical scholarship to develop several constitutive and structuring concerns which shape my methodologies and artistic projects. These concerns and key phrases are introduced and explained in this methodology section, with the exception of 'recalibrating value' which is expanded on in the contextualising research for 'Black Body Radiation: Rescripting data bodies'. These key terms are referenced throughout this thesis and guide my discussion of individual art projects and testing of digital retooling that concludes each project.

Keywords/ structuring concerns:

- speculative hacking
- bolstering co-immunity and co-vulnerability
- applying a trauma-sensitive approach
- changing default states
- recalibrating value
- challenging ambiguated consent
- rescripting agency

This chapter will introduce the theoretical groundwork and art historical references that inform the methodologies and structuring concerns that run through my practice and research. I also position digital retooling in relation to social practice and decolonial approaches to technology and data studies.

I begin by defining the modalities of my practice as coextensive with my digital retooling methodologies and offer a brief discussion of how digital retooling both broke with and emerged from research in my first year of study on the iconoclastic gesture.

Artworks that move in the world

At its core, digital retooling is about reprogramming default states, rescripting agency, and resisting dominant digital media practices by supporting alternative relationalities and situatedness in digital media. In my practice, digital retooling imagines radically different and liberatory outcomes by rescripting how digital technologies acquire meaning and value in specific contexts, considering who they are made by and for whom. Digital retooling is also about rescripting my sense of agency as an artist navigating digital media systems and extending agency into the datalogical and infrastructural layers of digital media production.

My artistic practice has evolved over the course of this PhD from creating studio-based artworks to designing process-based and socially engaged art projects. When I used to paint or create discrete art objects, I had a sense of when a work had achieved completion. However, as I grew frustrated with representation in my own work and sought to develop artistic practices that moved beyond image and interface, I began to turn to infrastructural and technical layers in digital media practice, as this backend and technical strata underlies and influences much of our lived daily experience in the digital era.

As I developed digital retooling in my practice, my work shifted towards process-based and collaborative art projects that have the potential to evolve over extended periods of time. As the processes and temporalities around my practice widened, I moved beyond the visual, recovering a sense of spatiality in my practice that seemed lost in my flattened and interfacial engagements with digital images and the image economy.

This transformation in my practice corresponds to a paradigmatic shift in line with what media scholars Lisa Parks and Nicole Starosielski have succinctly described as moving “away from the analysis of screened content alone toward an understanding of how content moves through the world and how this movement affects content’s form.”¹⁰ The artworks I have created through digital retooling are designed to move in the world: to build contexts, meaning, networks of care, and value over time.

Speculative hacking: from proposition to tangibility

Digital retooling engages an ethics of care, care as repair or recuperation, while centering architectures of choice, agency, and liberation. As a practice-based methodology, digital retooling moves beyond pictorial and discursive concerns to emphasise infrastructure, interfacial and backend design, and the processes by which media acquires new configurations, meanings, and forms as it moves in the world.

As an artistic practice, digital retooling encompasses both speculative and propositional imaginings, as well as tangible projects that become embedded in the world. This allows digital retooling to extend towards both imaginative and pragmatic goals, with an understanding that some ideations will develop into ambitious and tangible projects, while others have merit and value as potential, partial, or fantastical projects.

That said, all the works I am presenting in this thesis can be or have been exhibited, published, or engaged with by viewers or readers in their current state of development, which includes stages of proposition, testing, rehearsing, funding, and other modes of implementation.

‘Black Body Radiation: Rescripting data bodies’ has gone through its first rehearsal and exists as a video preview of a future performance series—the preview will be

exhibited at the RCA in September 2022. My images for 'Virtual Keffiyeh', a digital wearable and linked writing and advocacy project, have been published in +972 Magazine. 'Or:bita! Bloom,' as an early stage sustainability start-up for data-driven artworks, was exhibited as an installation of video and 3-D printed sculpture at the Terra Carta design lab in April 2022. 'Bath Motes: Liquid architecture for Pain Relief' is the only work that I consider complete at this time, in the sense that I have moved on from it, as it is intended to be a speculative, fantastical product and there is nothing more I want to develop in it. My hope for the other works is that they will continue to grow in the months or years to come.

Digital retooling in my practice has transformed from purely speculative imaginings to art works that are tangible, relational, and intended to move in the world. As these projects grow in complexity, scale, and impact over time, they involve new forms of collaboration and community.

From iconoclastic gesture to digital retooling

My first year of PhD research focused on using the iconoclastic gesture as a methodology, and an artistic strategy applied to digital media within a larger field of cultural and technological production. This drew on Boris Groys' work on the iconoclastic gesture, which he describes as the "staged martyrdom of the image" by the historical avant-garde, in which the image is "sawed apart, cut up, smashed into fragments, pierced, spiked, drawn through dirt, and exposed to ridicule" in "both symbolic and literal terms."¹¹ According to Groys, this process of destruction both makes way for the new and makes "wreckage" itself "the icon of new values"; the materiality of wreckage demonstrates how "strategically deploying iconoclasm" allows the avant-garde to shift its focus from the "message to the medium."¹²

The iconoclastic gesture makes use of wreckage, planned dysfunction, and the glitch to release latent and submerged materialities from pictorial regimes and hegemonic formations. As an event space, the destructive potential of the iconoclastic gesture creates possibilities for embodiment and phenomenological experience within technical or

ideological formations. As ideological and pictorial strategies break down, the unseen emerges as something that can be known or experienced.

My initial focus on the iconoclastic gesture was instrumental in pushing my research and practice beyond the interface and image. However, iconoclastic strategies felt too decisive and disconnected for my own personal sensibilities as an artist, as positing destruction as the site of the new felt out of sync in my considerations of the traumatic and post-traumatic. What I was looking for was a radically different way of navigating a digitalised world as an artist, to find pathways beyond the pictorial and image-based that could stage or rehearse new agencies and relationalities through my digital arts practice.

Therefore, while sharing with iconoclastic approaches a desire to move beyond pictorial and ideological representation, digital retooling is a restorative and relational project that searches for digital arts strategies to counter the destructive dimension of digital systems already at work in the world.

Retrofitting as social practice

In my research for this PhD, I develop digital retooling for care, value, and community as a methodology which ties together strands of socially engaged practice with digital arts and opposes digital media's bifurcating tendencies which separate image from interface. This bifurcated condition between reality and image is described by philosopher Guy Debord as occurring "in societies where modern conditions of production prevail, all of life presents itself as an immense accumulation of *spectacles*"¹³; and "separation is itself an integral part of the unity of this world, of a global social practice split into reality and image."¹⁴ According to art historian Claire Bishop, artists working in socially engaged practices and participatory arts continue to respond to Debord's theorisation of the 'spectacle', whose attributes, Bishop writes, do "not describe the characteristics of a work or architecture but is a definition of social relations under capital."¹⁵ However, for Bishop an important delineation must be drawn to keep socially engaged art from collapsing into political activism. As she writes "this new proximity between spectacle and participation,

underlines for me, the necessity of sustaining tension between artistic and social critiques.”¹⁶

My digital retooling methodology positions my artistic practice at the intersection of socially engaged practice, the arts, and speculative design. This positioning is informed by interdisciplinary and auto-ethnographic research and draws from artistic strategies to cut through the bifurcating tendencies of digital media, which produce divisions between image/data, seen/unseen, interface/infrastructure, and information/energy. The strategies I deploy in my practice use backend redesign, speculative hacking, and an expanded trauma-sensitive approach to recalibrate the politics of visibility in digital media systems.

Digital retooling as an artistic practice overlaps with important issues related to social justice and digital design, as both contend with interfacial aesthetics, participatory design, back and front-end interactions, default states, and other features specific to digital media. If digital artistic practices are to be retooled as liberatory practices, care should be taken not to replicate discriminatory default states. As activist and designer Sasha Costanza-Chock writes:

A paradigm shift to design that is meant to actively dismantle, rather than unintentionally reinforce, the matrix of domination requires that we retool. This means there is a need to develop intersectional user stories, testing approaches, training data, benchmarks, standards, validation processes, and impact assessments among many other tools. Yet the idea that we need to retool is sure to meet with great resistance.¹⁷

By drawing on important debates pertinent to digital design, I do not mean to imply that my practice as a digital artist should replicate the work or focus of digital designers. In my practice and research, I develop and apply methodologies of digital retooling that are specific to digital arts while staying abreast of relevant issues related to design and social justice. Design and art turn on different axes, in terms of negotiating usability, authorship, participation, functionality, and aesthetics. That said, my practice as a digital artist and the work I am submitting for this thesis have benefitted from creating links and hybridisations across prescribed parameters, including digital arts, participatory design, and digital design. Having flexibility and breadth has enabled me to better grasp digital media’s

complex social, economic, and political layers in order to bring these meaningfully into my artistic practice and thus enable productive understandings between diverse fields of knowledge through my arts practice.

I see the work and methodologies that make up this thesis as connected to multiple disciplines while retaining strategies and creative outcomes specific to the visual arts and digital arts.

Retooling as decolonial practice

Digital retooling is informed by writers, theorists, and artists who have used postcolonial and decolonial frameworks as a way of envisioning alternative uses for existing technologies and to break from master narratives. In her work on critical race theory and digital technology, Ruha Benjamin examines how racialised and discriminatory codes are inherited and reproduced as default states in digital technologies today. However, she sees a place for retooling technologies within an abolitionist approach to science and technology. As she writes, “this work has a lot to teach us about reimagining the default settings—codes and environments—that we have inherited from prior regimes of racial control, and how we can appropriate and reimagine science and technology for liberatory ends.”¹⁸ For Benjamin retooling is a way of practically and imaginatively envisioning technological use that both uncovers the fallacy of the neutrality of technology and its separation from capitalist and colonial histories and practices.

Thinking digital colonialism and digital capitalism together provides a powerful framework for approaching digital media’s imbrication with data extractionism and the digital production of inequalities. Critical data scholars Nick Couldry and Ulises Ali Mejias survey the recent decolonial turn in technology studies and “the advantages of the decolonial turn as a transhistorical tool to understand continuities between colonialism and capitalism.”¹⁹ For Couldry and Mejias, the digitization of life and extraction of data by powerful and corporate state actors in the Global North and South, can be better understood through “through the double lens of colonialism and capitalism” as “this approach foregrounds data extraction’s implications not just for profit, but for the

governing of human life and freedom.”²⁰ Drawing on their “data colonialism thesis”

Couldry and Majias argue that:

the practices of data appropriation and processing are themselves a *distinctive new type* of resource extraction with global significance and, as such, represent a historic new phase of colonialism: a new asymmetric mode of dispossession *through data* based in an enduringly colonial conception of the world’s material and immaterial resources, and the entitlements that supposedly flow from them.²¹

While my research for this PhD does not endeavour to be a treatise on data colonialism or digital colonialism, my digital retooling methodologies integrate decolonial strategies and vectors in my artistic work, putting them into practice in specific art projects. This is especially evident in my rescripting of agential data bodies in ‘Black Body Radiation: Rescripting data bodies’ and in ‘Virtual Keffiyeh’ which is designed to show solidarity for Palestinian digital rights in virtual and metaverse spaces. I discuss these decolonial dimensions in more depth in my presentation of these works.

Digital retooling is an integrative artistic, political, social, and technological methodology that combines critique and resistance with the generative and aspirational thrust of artmaking. The artistic and interdisciplinary methodology I propose in this PhD speaks to and with other practices at the intersection of digital practice and socially engaged art, to explore tensions between systems of knowledge while endeavouring to radically recode or recalibrate interactions between them. As artist, healer, and political activist Tabita Rezaire writes:

What is a technology? One definition of technology is the application of scientific knowledge for practical purpose. Here the tension lies within “scientific knowledge,” as the hierarchy between systems of knowledge imposed by coloniality only considers Western rationalist/ logic/ “proven” knowledge as scientific. When you detach from these racist biases and allow other cultures of science to exist, then the meaning and scope of what technology can be expands radically. We have much to retrieve in terms of connectivity.²²

The “meaning and scope of what technology can be” expands by deprioritising scalability and thinking more about local occurrences. As social media platforms and

other large computation-based projects are designed for scalability, these generalised and hegemonic approaches overlook or fail to take responsibility for local contingencies on the social and individual level. Postcolonial computing is one branch of development—and community-oriented technological practice that takes the notion of scalability to task. As the authors of “Postcolonial Computing: A Lens on Design and Development” have argued, “the notion of a hermetically sealed, all-in-one, plug-and-play design—seemingly perfectly adapted to an environment without an extensive technological infrastructure—turned out, in fact, to render it useless in the face of local contingencies.”²³

My work centres local contingencies against the grain of universalist computing, including decolonial strategies in specific art projects. In shifting my artistic engagement towards rethinking backend design and datalogical elements, my work began to feel aligned with a tooling or toolmaking practice that endeavors to take apart or tinker with the hegemonic, colonial, violative, and exploitative dimensions of digital technology. As Ruha Benjamin writes, “let us shift then, from technology as an outcome to toolmaking as a practice so as to consider the many different types of tools needed to resist coded inequity, to build solidarity, and to engender liberation.”²⁴

Co-immunity and co-vulnerability

My research combines an ethics of care to create both speculative and practicable retoolings of digital media technologies. Following the work of science and technology scholar María Puig de la Bellacasa’s *Matters of Care: Speculative Ethics in More Than Human Worlds* I locate my situatedness within a knowledge politics that takes care as a material and embodied relationality in more-than-human worlds. For de la Bellacasa care is more than a fuzzy sentiment meant to smooth over or relieve tensions. Rather, care’s disruptive potentialities and capacity to work with existing tensions, brings new speculative methods and techniques into existence. As she writes:

Staying with care’s potential to disrupt thus is not (only) about making visible neglected activities we want to see more ‘valued’—for instance, as ‘productive’ activities with an economic worth that should be recognised. It requires engaging

with situated recognition of care's importance that operate displacements in established hierarchies of value and understanding how divergent modes of valuing care coexist and co-make each other in non-innocent ways.²⁵

My artistic practice builds on the disruptive potential of care through digital retooling methodologies and designing pathways for care to grow or circulate around specific issues or local concerns. These networks can be diasporic, temporary, durational, individual, or collective. Networks of care diverge from social media's exploitation of community and audience building for marketing or entertainment purposes. In my work I have tried to create opportunities for networks of care to germinate by focusing on local and specific projects, creating space for collaboration and participatory projects, making transparent the datalogical layer, and staking involvement in the work's digital infrastructure.

The internet as it is currently configured developed according to a neoliberal agenda that diminishes care and community, reflecting a rerouting of the communicative or creative capacity of a digital public enclosed by commercial interests. The word *public* is seldom used to refer to private platforms, making the word *community* one of the most abused words in today's corporate lexicon. Community is a fuzzy substitute for an industrial-sized global user-base commodified as audiences to advertisers. It is also the corralling or cutting short of anything that might resemble a digital public space by neoliberal and capitalist interests.

Digital media driven by commercial interests and monopolistic platforms has exploited the notion of the digital 'community' to create a competitive, rewards-based marketing system based around viral content and the super abundance of bite-sized content. The era of mass social media, or Web 2.0, brought to bear the destructive potential of social media and digital technologies to disrupt or "break" societies, politics, and business-as-usual.

In breaking from social media's exploitation of community, the networks I attempt to build through my projects are a retooling of digital media's 'social' dimensions towards care and co-immunity. In this thesis, I introduce three projects that facilitate networks of care. 'Blackbody Radiation: Rescripting data bodies', 'Virtual Keffiyeh', and 'Or:ital

Bloom' all work to build a network of care around the specific projects and interventions. These works engage with the capacity of digital arts to build networks around critical social and environmental issues, or specific art interventions.

I refer to these networks as 'co-immunities' drawing from Roberto Esposito's work on immunological paradigms which have been used as a political dispositif to formulate boundaries between what is coded self and other, internal and external, and in treating threats as an externality.²⁶ Co-immunity expresses non-violative and mutable relations of what is coded self and other, externality and internality, self and environment, and the role that difference plays in creating solidarities through a shared sense of co-vulnerability. A shared sense of co-vulnerability is informed by rescripting default states of wellness and challenging both ableist and neoliberal formulations of subjectivity that diminish the need for care and its importance in social networks.

Changing default states

Starting with my own experience as a digital user and informed by feminist and crip narratives, my work takes as its default the vulnerability of digital users, the need for care in digital systems, and the possibility of rethinking digital communities as sites of co-vulnerability.

Default states of wellness, health, or capacity tend to underwrite conceptions of public space based on attitudes towards the body in relation to its vulnerability and need for care. In 'Sick Woman Theory' artist and writer Joanna Hedva questions the notion of a public space, as she finds herself unable to attend protests for Black Lives Matter due to a chronic condition that confines her to her bed. Raising her 'sick woman fist' in solidarity she questions the politics of a public space that creates a binary between public and private space. For Hedva, differences between bodies that are considered political, and bodies deemed apolitical are based on underlying assumptions about strength and vulnerability, which are rooted in a politics of care or absence thereof. These are tied to historical gender-based prejudices in which "illness, disability, and vulnerability *feminise*—e.g., render 'weaker' and 'more fragile'—any person who requires care."²⁷

According to Hedva current politics diminish the importance of care as a function of capitalism, neoliberalism, white supremacy, and gender and race-based discrimination because “to stay alive, capitalism cannot be responsible for our care—its logic of exploitation requires that some of us die.”²⁸

Hedva goes on to argue that a problem with delineating a public space from a private one is that it renders those who either prefer or are compelled to stay at home as apolitical or not able to fully participate in radical or emancipatory politics that require action on the street. In this sense, digital technologies can offer beneficial forms of participation and community for those who are at home or prefer digital engagement over physical encounters. There are manifold reasons why people could prefer digital communication and participation to meeting in real life—ranging from costs, convenience, to being able to work from home and so on. Therefore, the ability to form digital communities and networks plays a vital role in opening up accessibility and democratising participation between multiple locations.

In my thesis, I apply Hedva’s writing on attitudes towards the sick woman body and ableist conceptualisations of public space to rewrite the default settings of digital media as a space where greater care is needed. In my thinking and practice for this PhD, I attempt to rescript the body in relation to media, to emphasise its vulnerabilities and need for care in digital and technical systems.

An expanded trauma-sensitive approach

During the course of my research, I develop and apply an expanded trauma-informed approach which incorporates research and auto-ethnography. In this section I briefly outline my research on trauma-informed approaches and trauma theory, tracing where my practice takes some cues from this area of knowledge and also how it diverges. In addition to influencing the development of my methodologies as an auto-ethnographic and ethical practice, the representational politics and epistemological dimensions around trauma have deeply influenced my aesthetics as an artist by sensitising me to hierarchies of seen and unseen.

During the second year of my PhD, I surveyed several literary and psychological texts relating to trauma theory with the goal of mapping out how trauma-informed approaches might apply to digital design and the arts. I presented my research and findings in a talk entitled 'Trauma-Informed Approaches to Critical Theory Art and Design' at Across the RCA in February of 2021, which was attended by about sixty students. This helped me concretise my readings on trauma theory but also clarify where my interests diverge.

Working in a trauma sensitive way can make possible a new politics or aesthetics of visibility, to counter the trauma of not being seen or heard. Trauma-informed approaches to digital media means making space for the responses of users with higher trauma loads who may feel over-exposed, panicked, or overwhelmed in system architectures that do not take them into account in the design process. In my research, I have focussed on the ways that digital system architectures ambiguate consent or obscure agency. These feelings can arise in relation to user agency, shadowy background processes, the prevalence of non-consensual media, information overwhelm, discriminatory tech, inflexible universal computing, racist algorithms and countless other infractions and violations.

Generally speaking, digital and information designers do not consider users with traumatic stress responses when designing system architectures and interfaces. This reflects wider attitudes in the way that trauma is treated as a private issue and not a public or community-relevant matter. Often trauma survivors suffer re-traumatisation because the world around them does not want to listen, undervalues their experiences, or makes speaking about trauma difficult or taboo. These questions relate to larger epistemological issues as to what counts as knowledge, how knowledge is produced and who is considered to be a possessor of knowledge.

In order to engage with trauma as a source of knowledge creation, I had to trace how the concept of trauma can be applied transversally across cultures, bodies, and experiences, and to understand the pros and cons of such a broad and universalising approach. The notion of psychic trauma as an abstract category of experience is a relatively new development in psychological, theoretical, and scientific thought. Trauma,

which originates from the Greek word ‘to pierce,’ is inseparable from the practices and politics of differential exposure to wounding, devastation, and suffering. Epistemic violence and omissions have emerged across disciplines and sites of knowledge production in regard to who is allowed to feel pain or express grief at a given historical moment. To conceive of psychic trauma as a transcultural category of experience is to cut across biopolitical lines including racialised, class-based, and gendered vulnerabilities.

Psychoanalytic perspectives largely draw on Freudian definitions of trauma as an event outside of the ordinary that is capable of piercing or wounding the psychic barrier of the ego. Such perspectives do not account for microaggressions, quotidian forms of re-traumatisation, and cumulative or generational trauma. Furthermore, psychoanalytic approaches cannot account for the trauma of empire and global injustice without an approach that first “provincializes psychoanalysis”²⁹, to use Ranjana Khanna’s words, in order to create “a reading practice that looks to the haunted present and to the future and allows for a responsible feminist analysis of coloniality.”³⁰

In considering the usefulness or need for an articulation of the traumatic across multiple sites or subjectivities, one can brush over the successes and failures that have emerged as a result of applying theories of the traumatic across cultures and subjects. As a key example of consolidating a wider approach, the formulation of post-traumatic stress disorder as a psychiatric condition required the epistemological integration of two bodies of knowledge: one related to the highly gendered/feminised psychoanalytic concept of hysteria, and one related to veterans of war and largely masculinized shell shock syndrome. PTSD was accepted as a diagnosis by the American Psychiatric Association in 1980, only after significant advocacy between both the women’s liberation movement and Vietnam war veterans’ groups. As Judith Herman writes, the recognition as to the effects and symptoms of trauma across societal and gendered lines created new paradigms and equivalencies such that historically produced symptoms of hysteria could be seen as “the combat neurosis of the sex war.”³¹

However, the widespread acceptance and adoption of PTSD has been heavily criticised by postcolonial trauma theorists such as Stef Craps who argue that existing definitions reflect a “Eurocentric, monocultural orientation” that are ill equipped to deal

with both the large scale and quotidian traumas of racism and empire; additionally, these exclude indigenous formulations or approaches to trauma and grieving.³² For similar reasons, trauma theory, which emerged out of the so-called ethical turn in the humanities in the 1990s, has struggled to bring about meaningful discourse across cultural, racial, gender, and class lines, having to contend with its own Eurocentric leanings and psychological universalism.

While my research explores trauma theory as it developed in western humanities, as well as attempts to decolonise trauma theory and make it more sensitive to difference, I also look into practical guidelines produced by clinical and social services. 'Trauma-informed approaches' is a term that originates in a set of guidelines put out by the Substance Abuse Mental Health Services Administration (SAMHSA). These are based on years of recommendations and inputs from professionals in the public health sector with direct experience of working with trauma survivors.

SAMHSA's recommendations were compiled into a set of influential organisational and institutional guidelines that were published in a document on trauma-informed approaches in 2014. The document summarises this approach as:

A program, organisation, or system that is trauma-informed realises the widespread impact of trauma and understands potential paths for recovery; recognises the signs and symptoms of trauma in clients, families, staff, and others involved with the system; and responds by fully integrating knowledge about trauma into policies, procedures, and practices, and seeks to actively resist re-traumatisation.³³

The SAMSHA document builds awareness about recognising the signs and symptoms of trauma as well as recommendations for resisting re-traumatisation. These include enhancing safety, trustworthiness and transparency, peer support, and empowering agency across the physical environment, organisational structure, financial systems, and management.

My own work and research focuses on the epistemological dimensions of traumatic stress and experience as capable of producing knowledge in the digital arts. In the course of my study, I moved away from trauma theory as a cross-cultural discursive or literary

tool to focusing on how my own particular experience and sense of vulnerability as a digital user with C-PTSD informs my practice and interventions. These form the original impetus for my critical research and artistic works, which I have grounded in an expanded trauma-sensitive approach.

My methodologies draw from epistemologies that value traumatic experience as a source of knowledge creation. Drawing from trauma theory and trauma-informed approaches has given me the tools to develop methodologies that negotiate and make use of my own responses. In my work, I have understood a trauma-sensitive approach as an expanded political, economic, and psychological project that emphasises restoring relationality, trust, transparency, and community. This reaches beyond the interfacial layer of user experience to address the traumatic histories and the political, economic, and social dimensions that make up human and nonhuman substrates of digital media. I take an expanded trauma-informed approach as an epistemological tool capable of offering unique insights into human-centered digital practices that are psychologically informed and critically positioned in relation to the widespread systemic injustices reproduced by dominant digital media.

The difference between a trauma-informed approach and an expanded trauma-sensitive approach reflects a shift in focus and scale but can be thought simultaneously and commensurately. Trauma-informed approaches to digital media centre a vital accessibility issue, as current digital design practices often exclude large portions of the population who have higher trauma loads and stress responses due to illness, injury, childhood sexual abuse, domestic abuse, war trauma, and countless other examples. In my work and research, I apply my own take on an expanded trauma-sensitive approach that recognises the vulnerability of the body and psyche to traumatic responses across a wide range of fields and agencies. How this might be applied in current digital systems relates to wider issues of systemic change and socio-environmental justice.

An expanded trauma-sensitive approach can also include emergent relations between human and nonhuman agents, such as interactions with algorithms, codes, AI, and automated systems. These could be subtle and ambiguating, like microaggressions, or obviously violative and puncturing, like in the system architecture of automated

immigration schemes or military checkpoints. My research focusses on quotidian sites of retraumatisation in digital design, addressing the structural elements that make it difficult for individual users to differentiate themselves from macro digital systems or develop agency.

My methodologies take some direction from trauma-informed approaches but without a clinical or therapeutic agenda. Furthermore, I am not attempting to make trauma-informed approaches the sole focus of my work as I am not a clinician or therapist. However, making space for traumatic stress is a key element of my work as an artist and researcher, as it grounds my experience as a digital user. To further develop a trauma-sensitive approach that is relevant to digital arts and social practice, I decided to interview Grace Quantock as part of my second chapter, as she is a creative technologist and psychotherapist whose work I had come across while researching trauma-informed approaches to digital media. My interview with her anchored and stimulated my work as a digital media artist and forms an important contribution to my expanded trauma-sensitive approach and overarching methodological development.

The artistic practices, writing, and research I undertake for this thesis makes use of tensions and dissonances between the nonrepresentational elements of traumatic knowledge and elements of visual practice, not by representing the traumatic, but by enabling a processual reworking of the politics of visibility informed by a trauma-sensitive approach.

Ambiguated consent

Taking a trauma-sensitive approach to digital design means centring agency, navigability, giving users the ability to opt in/out of digital processes, and making choice architectures clear and transparent. Becoming aware of traumatic stress responses and triggers in digital design means becoming sensitive to how information is spatialised and presented in digital formats. This means asking questions like: do users feel they can opt in or out of processes and execute agency? Can users orient themselves in platform architectures and are these spaces mapped? Are users free to go forward or change

direction? I discussed choice points, maps, and interfacial architectures in my interview (appendix) with Grace Quantock who emphasised the difference between detainment and journeying:

If people are being detained against their will, if they've been trapped psychologically, or literally, then knowing where and how to get out, and how to escape what we feel is a rising claustrophobia can be really necessary. And it's about agency, do I have the agency to choose to go forward? Or am I being taken on a journey that maybe has been designed for me, but not with me, or to get me to a certain point rather than for me to have a certain experience that I want to have.³⁴

Rescripting agency opens new challenges in environments where consent is not overtly violated but instead ambiguated and obscured. In our interview, Quantock spoke about her counter-intuitive feeling that she had a clearer understanding of choice points while being detained at a police station than she did in her experiences at hospitals. In institutional settings like those she describes customer service and personability exist alongside the possibility of surveillance, blurred or limited self-agency, and the possibility of detainment.

When consent is ambiguated one loses track of one's yes and no, coercion and facilitation comingle into befuddlement, disorientation, and subtler forms of digital authoritarianism. Everyday diminishment of agency operate through technical holdups, detailed print, labyrinthine legal agreement or terms and conditions, and universalised and inflexible system architectures. The excuse of a dysfunctional computer or digital system gone wrong is parodied in the phrase "computer says no," which was the default attitude of the customer assistant on the 2003-2007 BBC show 'Little Britain'. Something similar is often heard at checkpoints in the West Bank with Israeli soldiers at checkpoints regularly subjecting Palestinians to longer, more gruelling wait times because "computer kharbana" or the "computer is broken."³⁵ The digitalisation of immigration schemes, as in the UK, takes scalability and universal computing to new levels, imposing new standardisations of processes, impunity, and digital authoritarianism disguised as technical function and the so-called objectivity of digital processes.

Ambiguous choice architectures form an increasingly important part of contemporary governance. Less coercive strategies of control in which consent is blurred and shaped through an understanding of behavioural insights remains a fundamental strategy of governance.³⁶ Choice architectures can be controlled through setting defaults, limiting choices, and obscuring transparency.³⁷ Subtler forms of coercion make choice itself designable through structural manipulation and confusing boundaries between yes and no. System architectures that influence decision-making point towards important questions as to the boundaries of the self and environments, and the ability of individuals to self-differentiate from environmental factors.

In current social media platforms, feedback loops modulate and blur the boundaries between the datalogical and personal, the technical and the intimate, self-differentiation and choice architectures that ambiguate consent. A personalised algorithm, for example, captures data about what posts you like or how long you linger over an image, and these feed into a datalogical layer which curates digital experiences around these preferences. This process inherently blurs boundaries between what is datalogical and personal, digital and bodily, outside and inside. In my own research I have referred to these entanglements as ‘nested intimacies,’ which I discuss in Chapter 2.

I discussed with Grace Quantock commonplace but untrustworthy intimacies that characterise users’ relationship with hegemonic digital technologies. The fact that digital technologies enable users to keep track of daily activities, support careers and personal networks, as well as simultaneously subject users to surveillance and shadowy background processes just adds to the confusion and opacity that characterises blurry or ambiguating choice architectures.

As I struggle with feeling triggered by the current internet’s blurring of outside and inside—a feeling of ambiguated consent, of not being able to navigate system architectures transparently, trust background processes and shadowy third parties, or locate agency—I have applied an ethics of care to give space to these anxieties and use them as prompts to transform or evolve my practice in new directions and to seek alternative ways of rescripting agency in digital and more-than-human worlds.

Digital consent

Models of consent are central to understanding and safeguarding boundaries of the self, defining key concepts about autonomy, freedom, and permissibility. Feminist frameworks of consent emphasise power dynamics and the capacity to say no within specific contexts and power distributions. Sexual consent models include enthusiastic consent, which means positive and embodied affirmation and not just absence of a no. Informed consent, a fundamental principle of medical ethics, stresses the quality of consent and informational empowerment. These frameworks move beyond a simple yes/no binary to frame consent as meaningful, relational, embodied, and continuous.

As automated and algorithmic-based systems become widespread, new models of digital consent are alarmingly lacking. AI and automated systems are being trusted to assess a wide range of processes from job applicant worthiness, medical insurance risks, and loan applications. Automated and intelligent decision-making, masked as predictability, is happening on an industrial and global scale.

Digital consent, in the era of social media platforms, has largely formed around a data extractionist model which presents users with binary digital choices: agree or disagree, opt in or opt out. Platforms routinely ambiguate consent to extract personal data— for example, by using cookies or labyrinthine terms and conditions, leaving users confused as to what they have consented to and if they have consented at all. As we move into AI-based systems and digital automation, oppressive and binary models erode the concept of meaningful and continuous consent.

Feminist data activist Joana Varon and researcher Paz Peña, argue that nominal and binary uses of consent in digital systems, which ignore asymmetries of power and social/historical dimensions, contributes to the “algorithmic oppression”³⁸ of marginalised groups. Varon and Peña’s research focuses on the “Digital Welfare state that automates inequalities” in Brazil and Latin America. For Varon and Peña, the “lack of meaningful consent” has contributed to the rise of these automated systems of oppression under new forms of data colonialism³⁹. As they write, “in the era of data colonialism, companies use long and incomprehensible documents, such as Terms of Service, as a form of power

(through the discursive act) to inescapably embed subjects in colonising relationships.”⁴⁰ For and Varon, dominant digital media pushes a low standard of consent “just as patriarchy tends to push down the standard of consent related to our bodies.”⁴¹

As meaningful consent is overlooked and eroded in global digital and automated systems, the oppressive and traumatic dimensions of hegemonic digital systems become all the more normalised and widespread. While my study for this thesis does not attempt to address the entirety of the topic of digital consent, my research and practice has searched deeply for agential positionings in an environment increasingly marked by different forms of digital colonialism and digital trauma, from the subtle to the aggressively oppressive.

My development of digital retooling responds to violative, ambiguous, and nonconsensual digital media practices by establishing artistic agency and the consensual sharing of data as core principles of my digital artworks and projects. These agential positionings hold through processes of automation and datafication and offer alternative alignments of affect/body/data that break with forms of oppression under data colonialism. ‘Black Body Radiation: Rescripting data bodies’ experiments with the generation of biometric data as agential extensions of the performer’s body which are rescripted into automated digital artworks. Or:bita! Bloom affords data sourced from sustainability reporting to be repurposed as digital plantoid beings whose autonomy supports nonhuman agencies for ecological good. These two examples show how different models of agency can be scripted into the backend design of digital artworks.

Rescripting agency

This PhD project began by tracing my responses to quotidian uses of digital media during the pandemic era. These triggers, though less obviously pernicious than other examples, caused me considerable distress as diminishment or violations of agency and consent can be bewildering or triggering for people with higher trauma loads. Trauma-informed-approaches stress the recovery of agency and community as part of the aftermath of living with trauma. These restorative guidelines have contributed to my

evolving concept of ‘digital aftercares’ as emergent modes of care for digital and more-than-human systems.

Digital retooling began as a project to recalibrate my relationship to digital media in the aftermath of traumatic events in my personal life and developed as a methodology that prioritises agency in overwhelmingly nonconsensual digital environments. As the digital assumes strange and alternate forms of disembodiment and embodiment— that include digital projections of selves as avatars, data bodies, or digital skins— rescripting agency in digital environments means affirming the agential in worlds that blur traditional definitions between outside/inside, self/environment, and data/body.

While theories of agency and free will are vast and complex, my work for this PhD deploys a pragmatic, feminist, and embodied definition of agency that draws from trauma-informed practices and enables me to reposition myself in digital worlds in opposition to violative, nonconsensual, or ambiguously consensual digital architectures. In short, my work is concerned with rescripting agency in relation to the traumatic, whose thresholds emerge in the suppression or overwhelming of agency. These deleterious and devastating posttraumatic aftermaths point not just to legal or philosophical formulations of agency, but to the embodied and experiential limits of the human body and psyche.

My work with digital agency manifests across many of the projects I present for this thesis. In the following presentation of ‘Black Body Radiation: Rescripting Data Bodies’, I discuss my digital retooling of data bodies as agential extensions of the performer’s body and in relation to theories of the avatar in performance artworks.

“BLACK BODY RADIATION: RESCRIPTING DATA BODIES”

A series of 3 performances / performance-driven NFTs or digital artworks

“Black Body Radiation: Rescripting Data Bodies” is a collaboration between digital artist Ameera Kawash and performance artist Ama BE. Over the course of three performances, the work explores tobacco as material, ritual, adornment, and value. Deploying body sensor networks and blockchain architectures, the artwork generates and rescripts data bodies as agential forces extending from the performance’s choreography, gesture, and repetitive movements. The digital infrastructure designed for this collaboration produces strangely intimate digital assets or performance-driven NFTs.

Using methods of digital retooling, the rescription of data bodies is intended to extend artistic agency into the datalogical, to be radically consensual, and to offer both a critique of the invisibility of the laboring affectual body under digital colonialism, as well experiment with alternative sources of value creation in artist-directed projects. The digital design radically retools current data extractionist practices, by which powerful states and corporations lay claim over our data bodies, to propose alternative, decolonial, and nonviolative contracts between datafied affects and audiences.

For the performances, Ama BE wears three body sensors that measure her heart rate, body temperature, and blood oxygen levels. These metrics are programmed to interact with blockchain infrastructures that modulate the value of linked NFTs according to the breath, exertion, and duration of the performance. Performance-driven NFTs propose alternative sources of funding for performance artwork and reimagines the role of audiences and collectors as supporters and co-vulnerable stakeholders.

A rehearsal of ‘Black Body Radiation’ took place on July 22, 2022, at Gallery 102 at George Washington University in Washington DC. Additionally, a preview of the work will be screened at the Fall Show at the RCA, between September 23-28th, 2022.



Fig. 1: Fitting Raspberry Pi and sensors. Screenshot from 'Black Body Radiation: Rescripting Data Bodies'

Overview

For this collaboration, Ama BE is fitted with three body sensors that measure her heart rate, body temperature, and blood oxygen levels. The data derived from these sensors interacts with blockchain-based architectures to initiate experimental forms of value creation for performance artworks. The digital infrastructure is intended to start a conversation about value and the invisibility of laboring bodies under digital capitalism, finding a thread that connects performance and endurance artworks, data bodies and affects, and the cultivation of tobacco in colonial legacies and practice.

We are so used to having our data bodies exploited without meaningful consent by big tech companies or by the digital state, under conditions of digital colonialism or data colonialism. Is it possible to collect and share data in a performance artwork that is radically consensual, extends artistic agency, generates multiple forms of value, and creates an environment of co-vulnerability between audience and performer?

My aim for this project is to design digital infrastructures that are radically consensual and artist-led, rescripting data bodies as agential extension of the performer's movements and gestures into the datalogical.

In the following sections I provide a journal of this project's development, a description of technical processes and backend design, contextualising research, and an analysis of the artwork's aesthetic, thematic, and experimental dimensions. I begin by stating the project's core themes, moving on to an explanation of how the technical infrastructure functions, a description of the rehearsal, and lastly reflections on my digital retooling methodology and digital aftercares as emergent modes of care in digital systems.

Collaboration

I met with Ama BE, a performance artist I admire and longtime friend, to discuss collaborating and experimenting with value creation in her work. I was compelled by her use of tobacco as a multi-dimensional materiality, the emphasis on cumulative gestures in her choreography, and how value could be interwoven into her durational performances to extend the artistic gesture into datalogical and economic layers of her work.

In her performance work with tobacco leaves, Ama BE uses repetition and ritual to approach tobacco as a materiality and medium imbued with historic, traumatic, and indigenous significance. Her performance centers West African masquerade traditions and indigenous North American tobacco ceremony, layers which remain suppressed in the smooth functioning of tobacco as a globally traded good. She approaches tobacco as materiality and medium linked to colonial legacies, the history of slavery, waged and indentured labour, indigeneity, and its current commodity form. As she describes in the preview video of 'Black Body Radiation: Rescripting Data Bodies':

Its simple, repetitive choreography engages tobacco as both commodity and sacred material in the process of transfiguring my body through ceremonial costuming inspired by West African masquerades like Zangbetor. Embedded with body tracking sensors, the performance positions spiritual and digital technologies on equal ground to enlist generated data as an agent for establishing new formations of value.

Ama BE and I agreed to work together on a collaborative project that would mix performance with experimental forms of value creation, combining choreography, body sensors, data generation, and digital programming. In her artist statement for this project Ama BE writes, “black-body radiation refers to the body’s thermal output...the performer’s body is both literal and stand-in for the ‘black-body’ as a labouring black African body, as a digitised conceptual body, and as a radiant thermal body.”⁴²

Data colonialism

The digital design for this artwork begins as a critical response to colonial and exploitative methods of data extraction. The creation of data bodies through body sensor networks is imbricated in asymmetries of power that make the quantification of the self intimately tied to processes of digital capitalism. Digital retooling attempts to aggravate and imagine alternative alignments between affect/data/value that are firmly anchored in meaningful consent, self-possession, and artistic agency. These aim to unlock new alternatives for the creation of value in performance artworks as well as open unconventional pathways of economic agency for performance artists.

For this collaborative work, I aspired to create digital infrastructures that would radically retool body sensor networks and blockchain technologies to create new relationalities, value forms, and modalities of support between performing artists, data bodies, and physical or digital audiences.

The digital infrastructure both offers an alternative to current alignments between bodies, affects, data, and value as well as critiques existing violative practices under digital capitalism and data colonialism. This critique operates by making visible the invisibility of labouring affectual bodies under dominant digital regimes and unlocking other possibilities for nonviolative contractual and relational agreements between performing bodies and spectators. This dual focus positions digital retooling as a propositional and potentially transformative method of engaging with existing technologies, as well as a critical method that exposes the parameters and extractionist logic of digital capitalism.

Critical data researchers Thatcher, OSullivan, and Mahmoudi, have argued that big data relies on processes of accumulation and dispossession to commodify and extract value from aggregate human data as an “intrinsic process to capital that continues to occur in novel ways alongside other capital processes.”⁴³ As they write, “big data as a current instantiation of processes of accumulation by dispossession and colonization of the lifeworld through the commodification and extraction of personal information as data.”⁴⁴

In their work on decolonial technology research, Nicolas Couldry and Ulises Ali Mejias, position critiques of digital capitalism by “reframing them in terms of colonialism’s long entanglement with both capitalism *and* knowledge production throughout modernity.”⁴⁵ This emphasises “data extraction’s continuity with colonialism’s histories of ruling and dividing people on a global scale, the decolonial turn foregrounds datafication’s continuities with historic forms of inequality, rather than seeing datafication as aberration of later modern Western democracies.”⁴⁶

The infrastructure ensures that the performer is not dispossessed of her own data bodies, and therefore experiments with alternative models for value creation in performance artworks which prioritise the artist’s self-possession. This creates ‘strangely intimate digital assets’ which are not digitally dispossessed, which I discuss in my final reflections on this project in relation to ‘digital aftercares’.

How it works

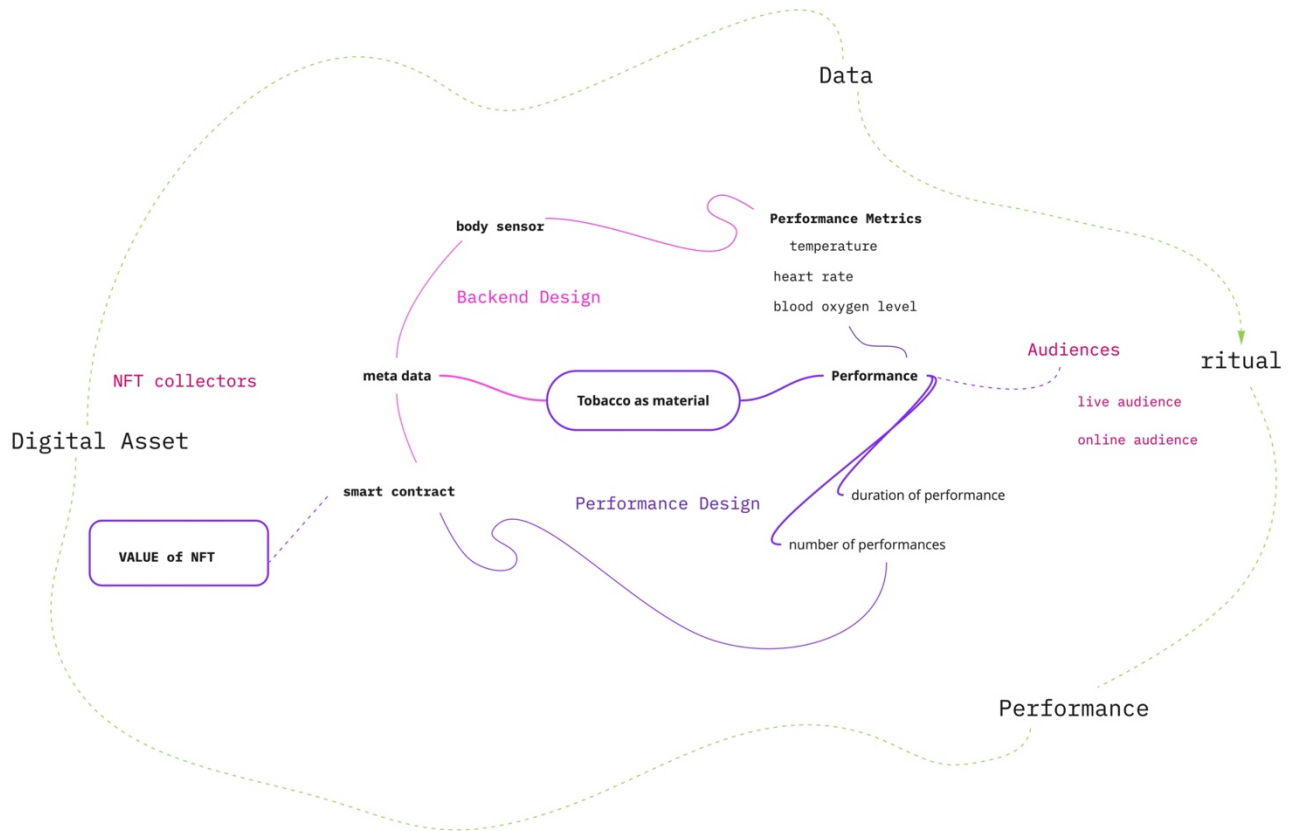


Fig 2. My original diagram for interactions between the performance and digital infrastructure

For the performance, Ama BE is fitted with three body sensors that are connected to a wearable Raspberry Pi, or minicomputer, which records her data in short intervals and sends it to a server where it can be retrieved in real time. As the performance progresses, Ama BE slowly and methodically sews together an adornment from tobacco leaves which she has placed around her in a circle.

The performance and act of adornment involves the exertion of physical energy and the accumulation of weight for the performer. Ama BE's exertion and bodily states are expressed as sensors pick up her heart rate, blood oxygen levels, and body temperature. This cumulative intensification of movement is captured in the data sets or data bodies produced by the performance.

Body sensor inputs are sent to the server where they are archived on a blockchain. The metadata data is programmed to interface algorithmically with a smart contract (a smart contract is a protocol that automatically executes certain actions) which produces associated NFTs at certain thresholds or intervals. The algorithm can apply fuzzy logic, meaning that it can take several variables into account rather than a simple “if” and “then” structure. We will design these algorithms as extensions of the performance into the associated digital artwork.

The smart contract automates the creation of NFTs at certain thresholds, allowing the digital artwork to unfold as multiple iterations. Bodily data interacts with the smart contract which trigger price changes in the associated NFT at the time of minting. The value of the NFT fluctuates according to Ama BE’s performance, which gathers expression, meaning, and value as a durational choreography.

Each performance will generate NFTs or digital artworks of 30 editions. As there will be three performances, 90 editions will be available in total (as artists we will keep 10 editions). These numbers may change in time, but for now we feel that this is in line with the scale of the work.

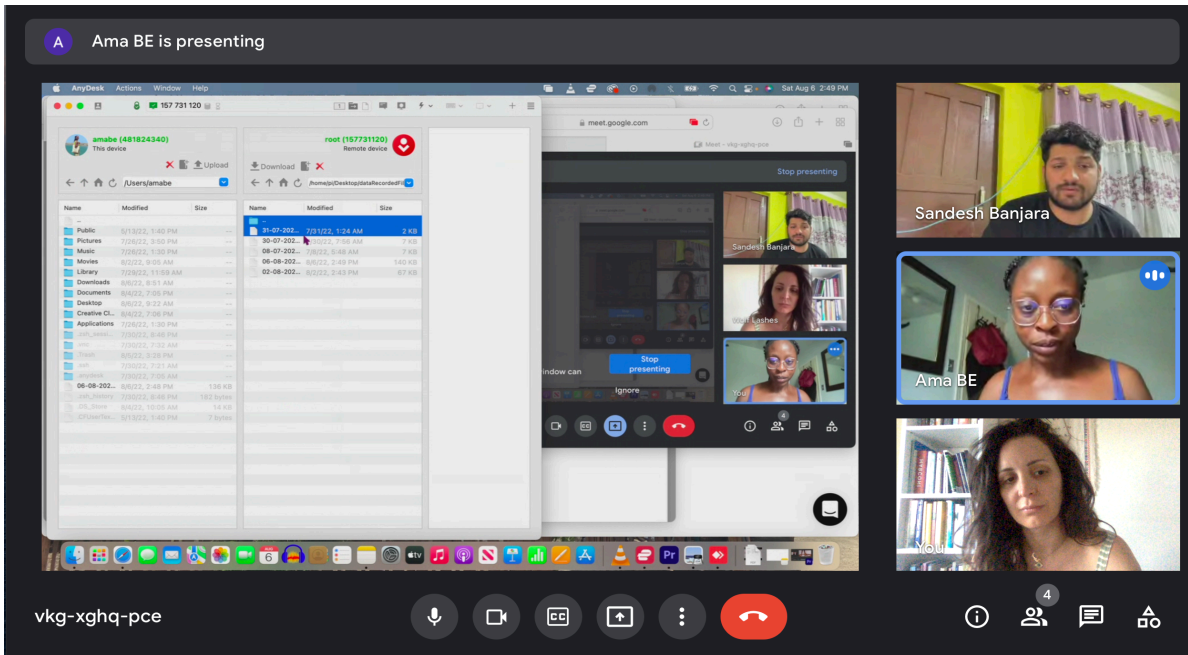


Fig 3. Upskilling. Learning to program interactions between Raspberry Pi and the server with freelance electrical design engineer Sandesh Banjara

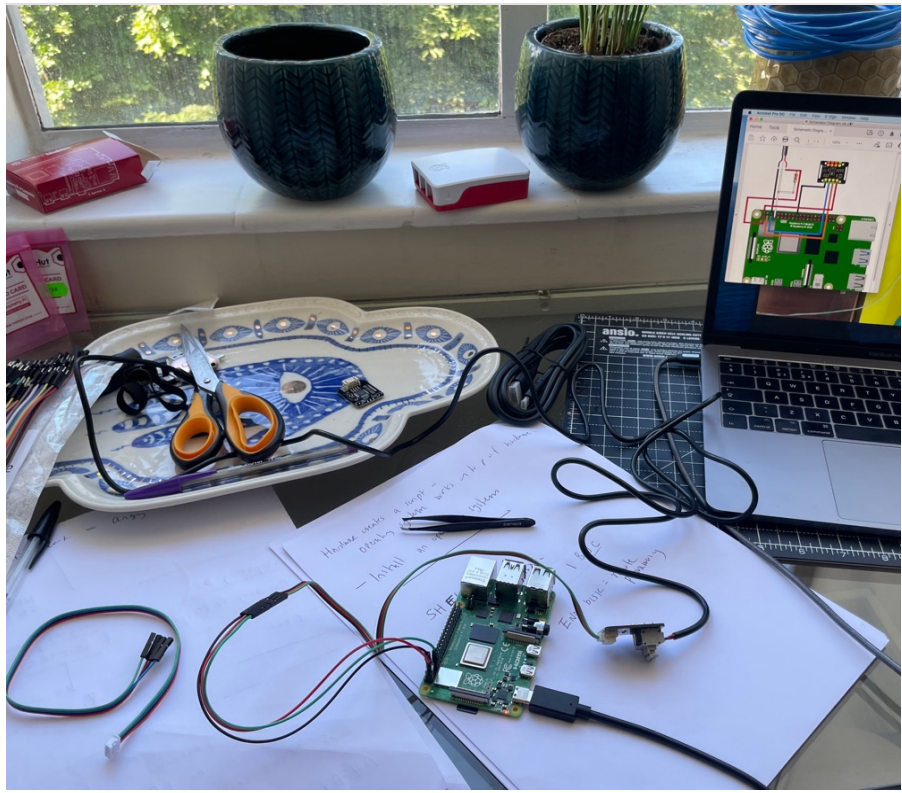


Fig 4. Testing the sensors and Raspberry Pi

Relationships with audiences, supporters, and collectors

The performance will unfold over three iterations and be open to physical and digital audiences. Body sensor networks generate data bodies which emerge from the performance, and these will not be dispossessed from the performer. Instead, the data will interact with blockchain architectures to produce digital artworks or NFTs at certain thresholds or intervals that are scripted by the choreography, movement, and exertion of the performer. The data bodies become the trigger points for the creation of digital artworks or NFTs.

Digital and physical audiences are invited to acquire digital artworks or strangely intimate digital assets, and to participate in the creation of value around the artwork as consensually connected and directed by the performer's choreography. This could create either a pooling of conventional monetary value or create pathways to experiment with other value forms, such as the creation of tokens specifically for this project. In either case, the project's commitment to non-alienation and radical forms of agency aims is to reroute or divert alignments between affect/data/value outside of the logic of data capitalism or data colonialism.

The project invites digital and physical audiences to acquire digital artwork as well as showing support for the performer through new forms of stake-holding around the performances. However, audience members can choose not to participate in the work as collectors or supporter, and simply attend the performances. It is not necessary for viewers to experiment with alternative methods of collecting performance artworks to appreciate the performance. Performance-driven NFTs break with the conventional logic of art collecting that involves purchasing an artwork as a one-way act of acquisition, to create a more a dynamic and embodied connection between collectors, audiences, and the performers over time.

Choreographies with data bodies

As this project continues to develop, the performance-driven NFTs or digital artworks could extend the visual nature of the work into dynamic data visualizations. This

would be a virtual representation of the data as a series of morphing data bodies, that respond to changes in body metrics corresponding to the performer's bodily state. The data bodies could be developed into a data twin, kinetic digital sculpture, or other responsive animations. This could be realised in AR/VR, holographic projection, or 3-D modelling.

Aestheticising the data bodies generated by this project is an artistic strategy that makes the datalogical and infrastructural elements legible, sensory, and dynamic. These visuals would render data tangible as alternatively embodied representations perceivable by audiences as well as by the performance artist. This could open the possibility of new choreographies with data bodies, enabling audiences and the performer to interact with performance metrics as visible or tangible data bodies.

Alternative funding for performance arts

By experimenting with alternative value creating structures, performance-driven NFTs can open alternative pathways of funding for performance artists through the use of body sensors networks and blockchain infrastructure. Performance artworks are often difficult to monetise, and performance artists face great challenges maintaining livelihoods through their work even when they take part in widely attended shows at well-known institutions.⁴⁷

Oftentimes, performance artworks rely on the sale of secondary documentation of performances. However, the experiential, live, and spatial experience of performance art does not always lend itself to photography and videography, which lie outside the work's ephemeral nature. Durational performance can have a cumulative expression that is difficult to translate. This project proposes an alternative pathway that is not based in conventional archival documentation or photography.

Performance-driven NFTs are an experimental method of self-funding artworks that highlight the immediacy and affectual nature of performance artwork. These NFTs are designed to extend artistic agency into the performer's data bodies and reconfigure the role of collectors and audiences as co-vulnerable stakeholders. The project experiments

with the choreography of data bodies into the datalogical, drawing attention to current alignments between affect/data/value and proposing alternatives retooled through artistic practice.

Rehearsal of 'Black Body Radiation: Rescripting data bodies'

I flew to Washington DC, my old hometown of 15 years, at the end of July 2022 for our rehearsal and testing of phase one of 'Black Body Radiation'. In this rehearsal Ama BE and I wanted to run through the performance and test the hardware as proof-of-concept. Gallery 102 at George Washington University kindly lent us their space for a few days.

Ama BE brought a large container of tobacco leaves. I learned that these leaves were difficult to acquire in their raw form and had to be continuously tended to and kept moist to keep from drying out. As she unwrapped them, they had a warm and aromatic smell that was much lovelier than the industrial smell of processed tobacco. It was the first time I experienced the rich olfactory layer of the performance.

Ama BE's rehearsal of the performance was an hour long. In the very first few moments before the performance I entered the tobacco circle, fitting her with the Raspberry Pi and Sensors. After turning the kit on, Ama BE began.

Though it was a rehearsal, Ama BE performed the work continuously, steadily, and without needing to stop or troubleshoot any elements. Her exactness and gracefulness of movement was truly remarkable and deeply moving to see in real life. The repetitive and cumulative nature of the performance was mesmerising from start to finish.

We hired a professional videographer to document the performance. The following images are stills derived from the video as well my photographs of the performance.



Fig. 5 & 6: Fitting Raspberry Pi and sensors. 'Screenshots from 'Black Body Radiation'



Fig. 7: 'Black Body Radiation' rehearsal. Photos by Ameera Kawash.



Fig. 8: 'Black Body Radiation' rehearsal. Photo by Ameera Kawash.



Fig. 9: 'Black Body Radiation' rehearsal. Photo by Ameera Kawash.

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Fig. 10: 'Black Body Radiation' performance metrics.



Fig. 11: 'Black Body Radiation' rehearsal. Photo by Ameera Kawash.

After the rehearsal: next phases

Both Ama and I felt that being able to run through the hardware and physical performance together was beneficial for us both and took the project out of the ideation phase into something that felt real. We were also able to troubleshoot the hardware and logistics around the performance and reflect further on the project's multiple layers.

Having completed the rehearsal and initial testing of our hardware, we created a video that introduces the project in depth. This can be used as an exhibition piece and in grant applications/pitches for further financial support.

Our initial estimate for the cost of developing the blockchain architecture, based on discussions with several developers, is approximately US \$10,000. My feasibility study for the project confirmed that the NFT infrastructure can be built within this budget. We plan to start fundraising in the early fall 2022, by applying for grants or looking for gallery backing / private investment.

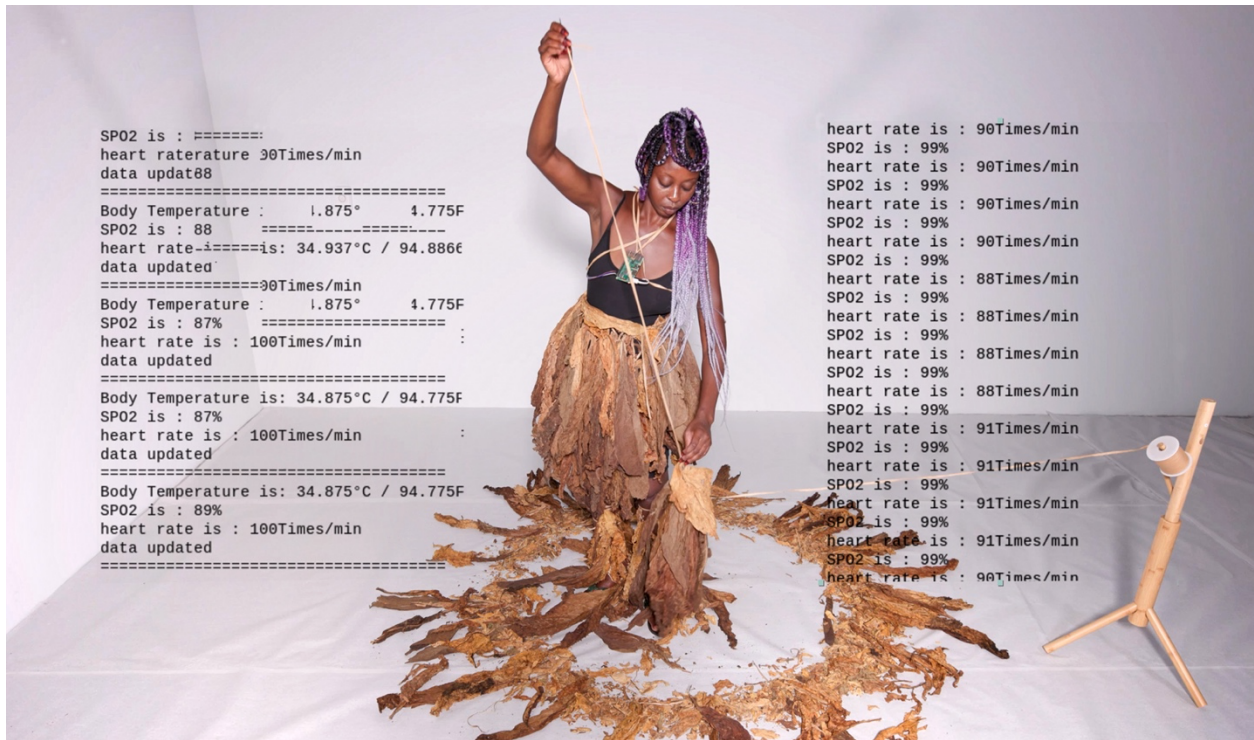


Fig.12 & 13: Screenshots from 'Black Body Radiation'

TEHCNICAL SUMMARY: PERFORMANCE-DRIVEN NFTS

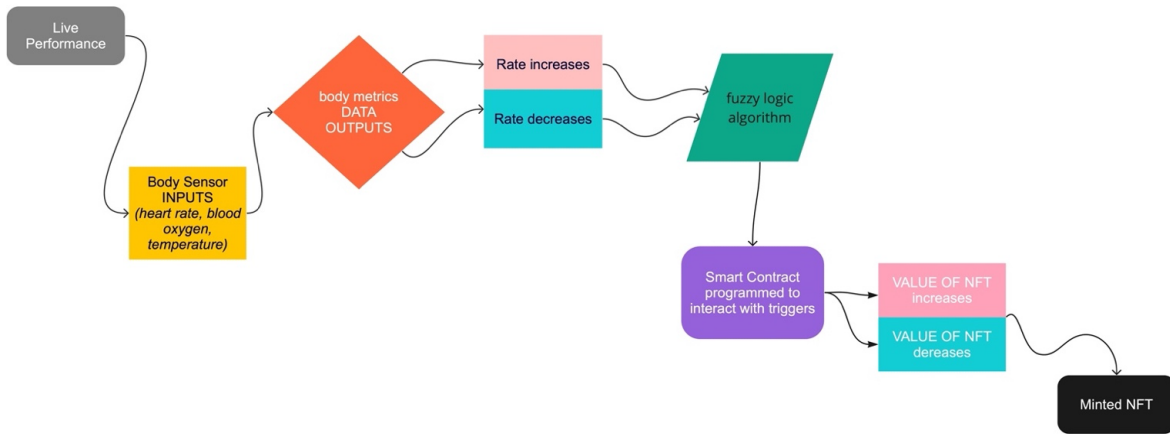


Fig 14. Schematic for Performance-driven NFT

SENSOR DESIGN

-Lightweight body sensors are placed on the performers body. These pick up the performer's body metrics in real time. These inputs include heart rate, blood oxygen level, temperature

-Raspberry Pi receives the data

-Outputs are uploaded to AWS Server or Google Cloud in JSON or Excel

RESPONSIVE ALGORITHM:

-An algorithm employing fuzzy logic interprets outputs based on the three variables (heart rate, blood oxygen, temperature). Thresholds are programmed to trigger responses in a smart contract which impacts the price of the NFT. These are updated in five-minute intervals.

SMART CONTRACT / NFT MINTING:

-Minting functionality will be implemented via Ethereum's ERC 1155 Smart Contract which can manage multiple token types

-Three NFTs will be minted in total. The first with 40 editions, the second with 30 editions, and the third with 30 editions. In total, 90 NFT editions will be available for sale, and 10 kept for the artists.

-30 editions of the NFT will be released for each performance using ERC 1155

NFT PRICING:

-The value of the NFT will be determined by changes in performance metrics. One such metric, for example, will make pricing inversely proportional to body temperature changes or blood oxygen rate of the performer.

-Collectors will be able to buy NFTs at five-minute intervals until the max limit for that performance is reached. The price of each copy would be based on the performance at that time.

-Once all the copies are minted, price changes would be subject to market forces and supply and demand.

DIGITAL/PHYSICAL ARTWORK:

-After the final performance, a video based on all three performances will be edited. This will become available to NFT collectors as well as pieces of the tobacco adornments from the performance.

'BLACK BODY RADIATION': TESTING OF DIGITAL RETOOLING

My PhD research on digital retooling for care, value, and community supports critical and creative investigations for reimagining and rescripting existing technologies to break from hegemonic digital practices. My schematic design for the backend of this project draws on several of this thesis' structuring concerns including centering agency and digital consent, bolstering community and co-vulnerability, rethinking value creation in art projects, and retooling as decolonial practice.

This project contributes to new knowledge through my digital retooling methodologies by both critiquing current alignments of body and data under digital capitalism and proposing alternatives through the creation of strangely intimate assets. The digital infrastructure I have designed for this collaboration proposes new models of digital consent in digital and automated systems, as well as experiments with alternative modes of funding performance artworks. These contributions are relevant to the fields of digital and performance art, as well as creative and speculative technological design.

The following sections provide a discussion of my contributions to 'Black Body Radiation' and how these interact and develop my areas of research for this PhD. These reflections are not meant to encompass the entirety of the project or speak on behalf of Ama BE's work or the performance. My goal in this collaboration is to dialogue with Ama BE's work through the digital design, without directly intervening in the development of the work's gestural, thematic, ritual, or expressive features.

In her statement for this collaboration, Ama BE writes:

In this collaboration, I was invited to expand on my recurring themes of embodiment, commodity and indigeneity in my work into the digital realm. The technical structure of the performance establishes 'commodity' and 'indigeneity' as metrical inversions of each other, and authors a new syntax through which generative exchange in performance can be articulated.⁴⁸

Avatars and agency

In my work for this project, I apply digital retooling methodologies to alter current alignments between affect/data/value under digital capitalism, into processes and outcomes that rescript agency for performance and digital artists. Choreographies with data bodies attempts to locate extensions of artistic agency and non-alienation in alternate presentations of the body as data.

Rescripting agency in digital environments addresses the presentation of the self as both embodied subjectivity and alternately embodied digital object. In 'Embodied Avatars: Genealogies of Black Feminist Art and Performance', performance studies scholar Uri McMillan considers strategies and aesthetics emerging from the tradition of black women performance artists that utilise self-objectification as a mode of agential embodiment. The performance strategies emerging from the work of black women performers often collapse traditional ontological distinctions between personhood and objecthood, as McMillan writes, and "repeatedly performed objecthood by deploying the tactics and aesthetics of the avatar."⁴⁹ As he points out the avatar is alternatively embodied, disembodied, or variously embodied, drawing from Hindu mythology as a form in which the deity interacts with the realm of mortals. Avatars, McMillan writes, "act as mediums— between the spiritual and earthly as well as the abstract and the real"⁵⁰; they include those that "are embodied, but also those that become disembodied, as these synthetic selves are distended across disparate representational forms."⁵¹ However, in McMillan's analysis, "subjectivity and agency are always present... in the often complex and rigorous performances of objecthood"⁵² that he traces in his research.

McMillan's theory of the avatar in relation to strategies of self-presentation in performance art is helpful in thinking about digital consent and agency in environments marked by overlap and slippage between the datalogical, virtual, and real. In these alternatively embodied and variously embodied worlds, digital agency becomes all the more important to locate and inhabit, as the capacity for self-differentiation in human-engineered digital worlds that are overwhelmingly non-consensual or operate through ambiguated consent. This generation of data bodies for this project is meant to be a strong, unambiguous, and embodied act of agency on behalf of the artists.

Rescripting agency: new models of digital consent

In the current dominant digital environment, bodily data is extracted by third parties who wish to exploit gestures and micro-gestures by making personal information available to advertisers and other shadowy third parties. In this project, measuring and sharing body metrics is driven by the artists' authorial agency and is strongly consensual.

The performance artist is in control of directing the performance and sharing her body metrics with audiences. The data produced by the performance contributes to the development of the digital artwork and NFTs that derive value from performance metrics. This digital infrastructure produces strange entanglements between the personal and datalogical, bodily affects and monetization; a blurring of boundaries which I discuss in the next chapter as 'nested intimacies'. However, the nesting of affects and data opened up by this performance project is intended to increase the artist's sense of agency as well as open innovative channels for funding performance artworks.

In contrast to dominant digital media which captures users' data through murky or ambiguated consent, the digital infrastructure I have designed for this project is intended to rescript agency by making data capture and sharing a strong choice enacted through the embodied performance. Performance-driven NFTs retool current arrangements between financialisation and affectual resonances, by making this process deeply consensual, artist-led, and transparent.

The backend design puts forth a new model of digital consent and reiterates the importance of consensual data sharing in digital value creation. In the social media era, monitoring users' affects and engagements tends to be exploitative and erode meaningful digital consent by making it unclear how data is being used. Experimenting with new models of digital consent is vital to safeguard the boundaries of the self and define concepts of autonomy and freedom in emergent technical systems. Increasingly, digital and automated systems erode consent; therefore, experimentation with new models is key to safeguarding digital consent into the future.

Bolstering community and co-vulnerability

This project's digital architecture connects audiences to the vulnerability and strength of the performer under the exertion of the performance. It also considers the co-vulnerability of the audience through associated digital artworks or performance-driven NFTs. The quantitative and financial instruments designed for this project are driven entirely by the performer's artistic agency and consensual gathering of data, as an extension of the artistic gesture into the datalogical.

The project rethinks art collecting as a dynamic process of engaging with performance artworks as they occur as well as initiating alternative pathways for funding live performance art. This enables imaginings of strange new intimacies between the collector, the performance, and the artists that are consensual and encourage the development of digital artworks based on agential data bodies.

Digital retooling as decolonial practice

By generating an alternative engine of value creation, the work defunctionalises current alignments between body, data, and affect that drive digital capitalist modes of accumulation. In my work for this project, I am interested in finding a thread that connects the invisibility of laboring bodies under digital capitalism to colonial legacies and practice. This thread also plays out in the materiality of tobacco as it takes on alternate forms of value as ritual material or medium for performance artwork. The work counters the commodity form of tobacco as a de-historicised materiality embedded in globalised markets and colonial legacies and practice.

Performance-based NFTs use embodiment as a driver of value in contradistinction to hegemonic forms of value creation rooted in histories of racialised capital and alienated labor. However, the work does not wish to collapse value into a singular quantitative form, but to create a temporary artistic zone where multiple articulations of value—including financial, ritual, historical, affectual, and artistic value forms—play with and against one another.

The NFTs are configured to make data collected from bodily exertion, affective resonances, and ritualistic repetition modulate the price of the digital asset. By making

value creation contingent on gesture and bodily states, the artwork plays with and against hegemonic financial forms rooted in colonial practice and history. This targets the commodity as a form that historically disregards the labouring and suffering of colonised and oppressed bodies in the appropriation of value under capitalism.

Digital retooling for value

Drawing from Ruha Benjamin's concept of "retooling solidarity,"⁵³ I apply my digital retooling methodologies for care, value, and co-vulnerability, to reimagine how live performance, sensors, blockchain technologies, audience participation, and the historicised materiality of tobacco can come together to generate new aesthetic, participatory, and value creating experiences. By redesigning the digital infrastructure of NFTs to break with the quantitative and universalising logic of financialisation, value can be creatively generated between hyper-localised happenings, intimate bodily states, and participating audiences.

By correlating affectual resonances produced through the performance with quantitative measure and financial accumulation, the work does not intend to resolve movements and gestures into an overarching quantitative logic. Rather, the metadata taken from the body sensors and value creation mediated through the NFTs, are treated as mediums for the performance to further resonate. As differential relations, the quantitative and qualitative elements of the performance are played with or against one another, under the artistic direction of the performance artist and the digital artist. This reverses or convolutes what Brian Massumi's describes "as the primacy of the quantitative over the qualitative" in financial markets, where "intensity (affect) and measure (data) are played against one another in differential relations."⁵⁴ In this performance it is the play of affective and datalogical elements against one another and the primacy of the performance as a qualitative experience that drives the value of the work and will give it its unique vibrancy.

In this undoing between quantitative and qualitative forces, there is space for the materiality of tobacco to resonate and take value within the event of the performance. The

fields of emergence opened by the event and performance are given primacy as affectual and bodily states, which interact with performance-driven NFTs or digital artworks. The performer, deploying the language of gesture, repetition, and ritual, is the driver or conductor through which multiple values accrue, diminish, or are transgressed. These values also interact with the programming and infrastructure I have designed as a digital artist.

As a work of art, the performance plays with and against multiple articulations of quantitative and qualitative value: the value of the performance to audiences (who do not engage financially with the work), the value of the performance to collectors (who purchase digital artworks), the future value of the work as an artwork, the value of the artwork as a phenomenological experience, and the value of the work as ritual. This art project wishes to gather, choreograph, program, destabilise, and compose multiple articulations of value as artistic practice. This convergence is directed through the authorial agency of the performance artist, the authorial agency of the digital artist, the participation of audiences, and the tobacco as materiality and medium.

The artwork can be considered within the tradition of occult and ritual practices that incorporate financial remuneration, the presence of currency, coin-based talismans, money offerings, or other features of money-rituals. As ritual, the performance explores how digital assets can be incorporated within the tradition of occult ceremonies that involve financial remuneration.

Strangely intimate digital assets

Staying with embodiment, vulnerability, and agency, the digital architecture for this project supports the creation of data bodies as agential extensions of the artistic gesture. The artwork attempts to rescript the presentation of the body as data as an alternatively embodied self with personal, artistic, and economic agency. The data bodies generated through the performance become the threshold and trigger points for the creation of strangely intimate digital assets, or performance-based NFTs, which work to reconfigure hegemonic current alignments between body/data/value under digital capitalism and data

colonialism. These digital assets reflect imbrications of the biological, technological, historical, and intimate dimensions that I discuss in more length in the next chapter. As datalogical avatars, these blur the boundaries between human or nonhuman, organic and mathematic, self and alternatively embodied digital asset.

Strangely intimate digital assets are digital artworks produced through the digital infrastructure that I have designed for the project intimately linked to Ama Be's live performances. Strangely intimate digital assets approach performance art, spectatorship, and collecting as a nonviolative mode of value creation based around the connection between audiences, collectors or supporters, and the performance artist or artists. The digital artworks anticipate and support forms of co-vulnerability that emerge in the performance as a participatory event as well as in the creation of value in digital artworks as points of contact between artists and collectors or supporters.

As weird and experimental entanglements brought to bear through digital technologies, strangely intimate digital assets are retooled data bodies that have not been digitally dispossessed and stay close to the performance artist's body and the digital artist's design schema by becoming artworks.

CONTEXTUALISING RESEARCH: DIGITAL VALUE

In this section I consider texts and platforms that look at new imaginaries and pathways for renegotiating imbrications of data, finance, value, and embodiment in digital media systems. These approaches highlight the role of artistic and digital media practices in exploring or programming new articulations of value and care in social and economic networks. The frameworks I lay out in this section critically address the power of financialised digital media to shape individual and social relations, offering alternative economic propositions based on remediating derivative and affect-based dimensions of financial systems.

The Economic Space Agency is a collaborative platform made up of radical economists, software engineers, and activists that explores the economic space that digital media opens as well as endeavors to design new tools and engines of value. As they explain in their mission statement:

Social media horizontalised our communication, but left the information and protocol layer called the economy untouched. We can't control the economic protocols that underpin the value capture of our communication. The next generation media will redesign the default convergence of communication, finance, and computation and fuse message and economy in ways that are programmable from below.⁵⁵

The idea that value can be designable or programmable through a digital medium is an opportunity to rethink or reclaim how value is created. According to the Economic Space Agency this new "economic grammar" is open to all and "gives everyone equal capacities of economic expression and does not collapse into single universal value definition of a fiat money or a 'master token' (e.g. BTC, ETH, etc)."⁵⁶ This economic expression is closely related to Brian Massumi's text on revaluing value and the role of qualitative expressions of value in economic systems.

The idea that we need to ‘take back value’ is the central appeal in Brian Massumi’s *99 Theses on the Revaluation of Value: A Post-Capitalist Manifesto*. In the opening lines Massumi claims that “value is too valuable” to be left in the hands of those who have “only abandoned value to purveyors of normativity and apologists of economic oppression.”⁵⁷ To take back value means to reclaim its qualitative and quantitative dimensions, and to push value creation away from the quantitative determinism that defines contemporary capitalist accumulation. For Massumi the process of ‘revaluing value’ is coextensive with a recalibration of care, affect, and futurity in economic systems— all of which resist quantifiability.

Financial markets today are driven by value creation structures that instrumentalise and monetise speculative or potential assets. As contemporary post-Fordist markets are rigged to ever-more sophisticated and granular modes of data collection, Massumi sees finance as intimately tied to affectual responses that range from hype to panic to acquiescence. By integrating the indeterminacy and perpetual emergence of affect, financial capital moves closer to, and into, bodily states. Massumi calls this capitalism’s tendency towards “subjectivity without a subject,”⁵⁸ which, applied to the human subject, treats the individual as a “dividual.” Affective and bodily resonances become closely connected to financial systems, forming new power differentials by which the qualitative is produced as a surplus value and exploited by quantitative regimes of value.

To create “postcapitalist alternatives” within the ever-expanding domain of financialisation requires creativity and reverse engineering of existing mechanisms and structures. Instead of being a weakness or contradiction, duplicity, in Massumi’s treatment, opens the ground for postcapitalist possibilities to take root within a pervasive capitalist field. As he writes, “alter-economy projects need to build in, and build on, creative duplicity”⁵⁹ because “the postcapitalist future will grow in the pores of the capitalist field of life, in much the same way Marx said that capitalist society grew in the pores of feudalism.”⁶⁰ The immediate task is to create “temporary autonomous zones that might release postcapitalist potential into the wild, to proliferate.”⁶¹ These zones assert the primacy of the qualitative over the quantitative, by articulating and intensifying zones of

care—in other words “mobilising the self-organising, anarchic potential of surplus-value of care.”⁶²

Systems built on the logic of financialisation appropriate and recode the indeterminacy of affect, which allows for interoperability between disparate elements, but registers this in a quantitative or informationalised field. Drawing on Spinoza’s definition of affect as intensity or the ‘ability to affect and be affected’, Massumi writes there is “always an excess of emergence-ready qualitative conditioning over the captive accuracy of their quantitative indexing” as “*affective resonance ultimately resists measure*.”⁶³ For Massumi this excess on the side of qualitative immeasurability is the surplus value of life caught in the quantitative regime that is the default for capitalist forms of accumulation. The qualitative and quantitative are connected in what he calls “*disjunctive articulation*,” neither “identical nor opposite” but procedurally linked.⁶⁴ In financial markets, intensity (affect) and measure (data) are played against one another in differential relations that capitalise on the primacy of the quantitative over the qualitative. A postcapitalist project of revaluing value would reverse this.⁶⁵ As Massumi writes:

An alter-economy modeling itself more on derivatives than currency can potentially emulate this convergence, contriving to close the gap as much as possible between intensity and measure, between the bare-active movements of the qualitative field of life and its quantification, their forces joined for singularity—but in a way that is not in the service of capitalist accumulation, eludes capitalist capture, and resists separating off the convergences fostered into a hermetic domain of power.⁶⁶

Continuing on the theme of derivatives and their relationship to art-making, in “Art, Markets, and Finance,” Ivanova and Nestler survey contemporary art’s relation to finance. The methodologies they select address this relationship from two angles: the financialisation of the art market, and critical artistic practices that take on specific aspects of finance. The former relates to the emergence of “art as an alternative asset class to high-net worth individuals”⁶⁷ while the latter combines critical energies and artistic methods to create artworks capable of “cross-cutting dynamics of techno-financial societies.”⁶⁸ The

authors distinguish these latter approaches from artworks that deal with capitalist dynamics more generally to focus on finance's "abstracting qualities," which include the "societal fetishisation of money" and "the powers which strive to extend into every domain of life."⁶⁹

As art becomes increasingly imbricated with finance in highly financialised societies, it becomes more difficult to separate the two into distinct realms. Critical practice rooted in the 'detached observer' paradigm can often end up bolstering the very systems it attempts to critique because it can only produce discursive positions, not infrastructural change.

The strategies Ivanova and Nestler focus on emphasise tactics, enmeshed perspectives, and duplicity rather than observation-based methods rooted in the primacy of discourse. This includes technical involvement and rescripting in the form of redeployment, hacking, reverse engineering, manipulation, and refunctioning. Rather than attempt to transcend art's current financialised predicament, these methodologies "seek different modes of understanding and operationalising its own financialised condition, and to harness new ways of acting as an interface with other processes."⁷⁰ Simply put, contemporary's art absorption into global financial systems gives artists affordances to recode or reorganise infrastructural or systemic protocols by tactically rerouting or redeploying those same tools towards radically different outcomes or futures.

For Nestler, in order to engineer an infrastructural shift regarding art's financialisation, artists can hack into the "speculative thrust" of the derivative.⁷¹ This might offer inroads for artists whose careers and livelihoods are already dependent on a highly speculative and volatile space that stresses market performance. The current derivative paradigm in contemporary art is one in which "world-producing and transgressive art of the past is conserved as pure financial wealth by deflating its former radical political clout," making even radical art coextensive with neoliberal economic practices. As an asset class, art is a luxury good that has speculative value-creating potential while also congenial to maintaining easy liquidity. Freeports play an important part in art's financialisation, allowing artworks to be moved "across national borders without having to incur taxation that would be applied to capital transfer."⁷²

According to Nestler and Ivanova, artists who understand and engage this 'derivative condition' can develop future-oriented approaches that prioritise productivity and applicability. This could be in the form of rehearsing future possibilities, recoding or hacking into existing systems, and making sense of speculative dynamics that define financial markets. These dynamics create new interpolations between affects, bodies, data, and finance.

What is digital value?

The question of how financial value is produced in digital media, or if it is produced at all, is vast and complex, and my research into digital value does not attempt to arrive at a conclusive or comprehensive position on this topic. Value creation in digital media is tied to different conceptions of digital or informational labour, and its relationship to more conventional and concrete forms of labour. This is further complicated by the technical nature of digital media, which allows for extremely cheap and instantaneous modes of reproduction, as well dependencies on technologies related to automation, AI, and algorithmic programming.

Artist and writer Dave Beech summarises some key debates on the relationship between digital media, labour, and value production in his book *Art and Postcapitalism: Aesthetic, Labour, Automation, and Value Production*. Adopting a 'dual critique' of two opposing theories on digital value, Beech looks at the work of Christian Fuchs and the theories of Jakob Rigi.⁷³ According to Fuchs, social media platforms exploit the labor of digital users who create value by sharing, uploading, and creating content, while becoming an emergent form of unwaged labour.⁷⁴ However, in 'Value, Rent, and the Political Economy of Social Media', sociologist Jakob Rigi and media scholar Robert Prey determine that the capacity of digital media to produce value is undermined by its machinic tendency to approach zero value because of the nature of digital reproducibility.⁷⁵ As they write, "initial creation of information may require huge amounts of labour-time, it requires almost no labour-time to be reproduced."⁷⁶ For Riggi and Prey,

social media companies generate income in the form of rents that come from enclosing the digital commons, making this form of value creation more like land ownership.

Beech's analysis questions both Fuchs' idea that the digital user is inherently a creator of value and therefore a form of uncompensated labour, as well as Riggi and Prey's theory on the zero value of digital media because of its reproducibility. The internet and digital media bring together multiple forms of both productive and unproductive labor, which includes consumers, prosumers, and digital workers. As Beech writes "the analysis of the relationship between the internet and capitalism recognises a heterogenous lattice of productive, unproductive and useful labour."⁷⁷ Furthermore, difficulties also arise in trying to determine the difference between digital media's productive and distributive capacities.⁷⁸

For Beech, capitalism must continuously counteract the capacity for gratuity arising within the system itself through the application of zero marginal costs and advent of peer production following commercial products.⁷⁹ Beech concludes with multiple readings of Marx's fettering thesis, in which the technological or material productive forces of a society come into conflict with property and social relations imposed by capitalism. In Beech's own reading of this, a qualitatively different type of fettering would see the production of value diverge from production based on use and need.⁸⁰ This leaves some uncertainty as well as anticipation as to what roles art might play in various scenarios of fettering, given art's "hostility to capitalism that is rooted in the rejection of capital accumulation as the rationale for living."⁸¹

Recalibrating value

In my research and practice for this PhD, I incorporate and experiment with emergent modes of value creation as pertinent to digital media production. I draw from economic and post-capitalist theories of digital value as applied to digital economies. In my practice I approach value creation as both artistic economic agency through the infrastructural design of art projects as well as that which does not collapse value into a single hegemonic quantitative expression. In my practice, especially 'Black Body

Radiation: Rescripting data Bodies' and Or:bita! Bloom, I try to work backwards from quantitative or datalogical representation towards legibility and sensory expression as qualitative artworks or art events. My recalibration of value as it pertains to digital artworks does not deny the economic value of artworks or artistic labor involved but attempts to unmoor the digital economic value produced through artistic practice from extractive data colonialism and violative digital capitalism.

CHAPTER 2: NESTED INTIMACIES

In this chapter I explore strange and nested intimacies using an auto-ethnographic approach to map out human and nonhuman agencies of care and carelessness in digital media. The first part presents my video work 'Bath Motes: Liquid architecture for Pain Relief' which was made in tandem with writing and research for this chapter and is a fantastical product that both lampoons and seduces with promises of digitally mediated pain relief. The work presents strange and intimate nestings of trauma, embodiment, and data through daily rituals of self-care that have been productised by digital wellness technologies.

The second part of this chapter on 'nested Intimacies' challenges digital processes to develop greater sensitivities to traumatic thresholds, with a view of how this impacts posthuman ethics or understandings of the 'postbiological'. This considers the comingling of human and other-than-human agents in technical systems while focusing on the violative aspects of these quotidian happenings and their impact on the psyche.

The third section includes notes on my interview with Grace Quantock, a creative technologist and psychotherapist who works at the intersection of trauma-informed approaches and digital media. The interview forms the basis of my diagrammatic thinking in 'Strangely Intimate Diagrams' through which I attempt to map out relationships between my practice as an artist with dominant digital media. The final section incorporates writing on post-traumatic growth and paradigms of co-immunity and co-vulnerability. As a whole, this chapter works through important themes in my research and practice to renegotiate more consensual and non-violative boundaries between self and other or data and body. My writing, research, interview, and practice reflect an in-depth consideration of nested intimacies and trauma-informed approaches to digital technologies, all of which provide steppingstones towards my formulation of 'digital aftercares'.

“BATH MOTES: LIQUID ARCHITECTURE FOR PAIN RELIEF” Video, 9.38 Minutes

‘Bath Motes: Liquid Architecture for Pain Relief’ is a video artwork exploring the ambiguities of a speculative technology that turns bathing to a liquid media able to facilitate pain relief. Part infomercial and part guided meditation, it fantasizes and lampoons digital media’s intimacy with daily rituals and capacity to produce dissociative states.

This video was created during lockdown in London when residents were quarantined at home. During this time, I spent quite a lot of time in the bath to help with fibromyalgia and pain relief. This work both presents the illusive fantasy of digitally mediated recovery from physical and emotional distress as well as imagines strange intimacies with emerging technologies.

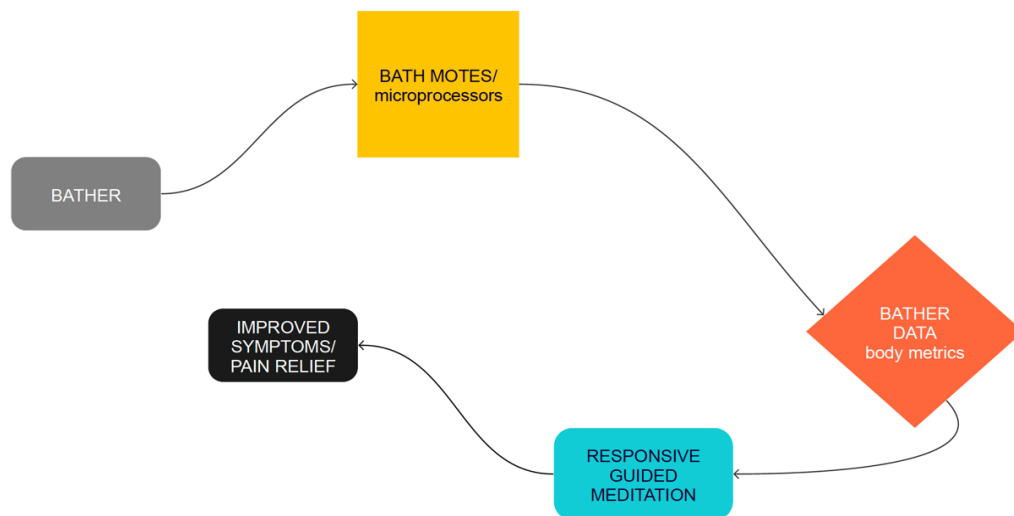


Fig. 15: Diagram of Bath Motes



Fig. 15 & 16: Opening sequence, video stills from 'Bath Motes'



Fig. 17: Video still from 'Bath Motes'

Overview

'Bath Motes' tells the story of a bather seeking self-care and alleviation of distressing physical symptoms through a personalised biosensing program that turns her bath into responsive liquid media. 'Bath Motes' is an imaginary platform that uses tiny micro processing units to capture health and biological data about the bather, which then feeds back into a personalised guided meditation. Technologically mediated self-soothing and self-care brings the digital technosphere into close encounters between human and other-than-human agencies.

The work is a fantasy of wellness and healing that repurposes motes, which are tiny wireless receivers/transmitters also known as smart dust. Motes can be deployed in the thousands to form sensor networks and are often used for surveillance purposes by military and security firms. In this work, I imagine using motes as a self-monitoring

biofeedback system which triggers a guided meditation based on inputs. The video takes an ambiguous tone between lampooning and marketing 'Bath Motes' as a product and engaging in the intimacies of self-care. I do not deny the seductive quality of advanced personalised and responsive technologies and the promise offered by the wellness tech industry to deliver pain relief, anxiety reduction, and healing.

'Bath Motes' lampoons self-care rituals that have been productized by wellness technologies while remaining sympathetic to users with higher trauma loads who are authentically opening intimate channels with digital media to search for relief from physical and emotional pain. The work responds to the commodification of trauma by digital wellness technologies which proffer treatment through the commercialization of self-care and extractive data harvesting techniques that operate under the conditions of digital capitalism or data colonialism. The nested intimacies produced by 'Bath Motes' commodify and recode post-traumatic healing through fantastical digital modalities that are emptied of embodied care and human relationality. In 'Bath Motes' aftercare is codified as the procedural and nonhuman optimization of affectual resonances and biometric data under a program of 'wellness'.

The relationship of the bather to the strange responsive bath media both demonstrates a strange intimacy with the media as well as offers a reduction of symptoms. Dissociative digital states are frequently sought for pain and anxiety mitigation in digital media, for example, through gaming, virtual reality, or watching a film. My intention was not to denounce these pathways of pain relief, but to reference the behaviour modification, intimate surveillance, and the datafication/monetisation of bodily states that also occurs in ambiguous digital spaces.

The video draws on my experience as a digital user with C-PTSD using wellbeing technologies and therapies during the lockdown phase, a period of time in which I took frequent baths to help with fibromyalgia and relaxation. Wellness and guided meditation videos often recode or displace post-traumatic stress within an aestheticised matrix of sensory pleasures, soothing imagery, and promises of optimal health. The work does not deny the seductive quality of wellness technology as well as the feedback loop's capacity to tune into emotional and physiological states with a surprising and troubling accuracy.

As an allegory of the relationship of the post-traumatic body to the digital, the fantasy structure of the piece reflects the power dynamics and strangely intimate relationship between affectual/bodily resonances with digital technologies.

'Bath Motes' is not intended to be about digital trauma as a violative form of intimacy, but about traumatic embodiment and the nesting of digital technologies in an intimate bodily space. This draws on auto-ethnographic and critical reflection on traumatic thresholds as a challenge or hard limit to the endless plasticity, technical positions, and limitless horizon of the digital.

'Bath Motes' represents my first attempt at deploying speculative retooling and imagining a rewriting of the datalogical layer and hardware to fit my fantasy of self-care as a user with traumatic stress. This work was an important step in developing my methodologies of speculative retooling and backend redesign. Though the work reflects my own fantastical rescripting of my relationship with digital media, it was crucial in shaping the retooling methodologies that I have applied to my more recent works for this PhD.



Fig. 18 & 19: Video stills from 'Bath Motes'

BATH MOTES: TESTING OF DIGITAL RETOOLING

An expanded trauma-sensitive approach

As the first work I made for this PhD, 'Bath Motes' represents my first attempt at deploying digital retooling as a methodology by fantastically rethinking technologically mediated self-care. It is a video artwork that directly addresses traumatic aftermaths and the mundane rituals around aftercare. 'Bath Motes' is significant as it opened new possibilities in imaginatively reimagining current alignments between data/affect/body. However, it is also pivotal in that it falls short as a work of digital retooling and digital aftercares as I came to define it.

Digital Retooling supports creative and critical explorations that break with hegemonic digital practices. While 'Bath Motes' offers a fantasy of self-care through digital media and has merit as an artwork, it does not break with hegemonic digital practices but only lampoons them. The work is important to consider within the development of my methodologies and practice, as a pivotal turn as well as the piece that deals directly with the vulnerability of the traumatised body and strange nested intimacies, through an immersion in fantastical liquid media.

'Bath Motes' addresses trauma by looking at its bodily traces and long afterlife in the body. As a fantasy product combining biosensing motes and responsive media, I reimagine quotidian bathing rituals meant to alleviate or regulate traumatic stress. Drawing from personal experience, the work speaks to technodelic approaches that promise to mitigate pain through digital visualisations or guided meditations. The slow and hypnotic pace of the video mirrors the sometimes mundane and tedious aspects of living with trauma.

The video encounters traumatic thresholds not as a mode of witnessing or testimony, but as remnants and traces in the body. There is much cultural emphasis on the representational aspects of trauma as an event, with its violent or violating aspects, and much less bandwidth given to its prolonged after-effects. As an artistic work, I shift from

representational tropes around trauma as overtly graphic or gruesomely fascinating, to deal with every day and long-standing aftermaths and aftercares.

My thinking for this work follows Griselda Pollock's suggestion to "think about trauma, not in terms of event (which we cannot know), but in terms of *encounter with its traces* that assumes some kind of space and time, and makes some kind of gap as well as a different kind of participating otherness."⁸² By focusing on the daily aspect of traumatic stress, the work avoids shocking or retraumatising elements, to highlight the daily and somewhat boring aspects of convalescence.

Drawing on my methodologies of an expanded trauma-sensitive approach, the work takes as its default state a viewer who might carry a heavy trauma load. Therefore, I refrain from addressing the traumatic as event and shift instead to aftermath and aftercare. As the first work I made for the PhD, this piece allows for a *different kind of participating otherness* to become productive without having to represent trauma as event.

As *participating otherness* the work occupies a strange and intimate space between the erotic and grotesque, the intimate and impersonal, the embodied and datalogical. This dissonance is enacted through juxtapositions of the child-like narrator, eerily soothing music, nude bathing bodies, distortive and glittery filters, and the glitchy architectural renderings of the bathroom and adjoining apartment. As a work on long traumatic aftermaths as they play out in contemporary daily rituals, the bather and her 'Bath Motes' enact the solitariness of recuperation from trauma as enhanced, intruded on, and manipulated by the imbrication of digital technologies into all areas of life.

New formulations of aftercares

Drawing from my previous chapter on nested intimacies, 'Bath Motes' presents a speculative product which entangles affects, digital media, and traumatic stress in a pleasurable but unsettling way that points to the limits of wellness technologies in conceptualising aftercares for trauma. Wellness technologies often allude to the promise of an optimised physical state, rather than living and thriving with pain, distressing memories, or traumatic stress.

As digital aftercare, the work imagines a sensory and pleasurable encounter with digital technologies and traumatic aftereffects in the body. However, the disconcerting aspects come from the recoding of pain in an aesthetic and commercialised matrix, as one might get from going to a spa or following a guided meditation about walking through green fields. Pleasurable pain reduction can take one out of the body and seduce into a gratifying but disassociated state. The development of 'digital aftercares' through this thesis, moves beyond the idea of the pleasurable or the ameliorating, towards new forms of agency, care, and relationality in digital systems.

As the first work I made for this PhD, 'Bath Motes' is important as my first step in using digital retooling as a practice and in working with my own traumatic aftereffects as a participating otherness. As digital retooling, the work incorporates speculative reimaginings of existing technologies through the design of bath motes in a biofeedback-type product. However, it does not incorporate the full scope of my digital retooling methodologies nor does it embody the objectives I lay out in 'digital aftercares', which I discuss in more depth in the next chapter.

While 'Bath Motes' can be regarded as achieving what it set out to do as an individual artwork, it is also significant within my practice for failing to accomplish digital aftercares as I later came to formulate it. For this reason, it is an important steppingstone in the development of digital aftercares as a much larger project than self-soothing and pain amelioration through digital media. 'Digital aftercares' as I came to define it through the course of this PhD, means discovering new formulations of care in emerging technological and more-than-human worlds.

Recognising the limitations of 'Bath Motes' as digital aftercare and overcoming the fantasy of wellness in my own experience with coping with posttraumatic aftermaths, my practice evolved to working with traumatic stress and aftercare beyond overwriting the traumatic through normative or ableist concepts of wellness. Traumatic responses call attention to the need for self-differentiation, refusal, choice points, and consent within posthuman or more-than-human assemblages or ecologies.

My practice after 'Bath Motes' grew to be more firmly grounded in approaching care as trouble and working with default states of vulnerability in nested intimacies while

searching out new relationalities. These considerations reorient default conceptions of the human body towards its vulnerableness and susceptibility to trauma, and articulate community through co-vulnerability.

CONTEXTUALISING RESEARCH: NESTED INTIMACIES ⁸³

I have never been good at splitting my attention two ways: texting and walking or typing and talking feels like rubbing my belly while tapping my head. Pandemic time brought strange dissonances and time signatures between the deceleration of physical life and acceleration of digital time. I have found myself trying to catch a beat between the slow and fast polarities released by the arrest of bodily and social activity and the opened floodgates of digital flows.

Liquid Modernity, Zygmunt Bauman writes, waged a struggle between “time and space, space was the solid and stolid, unwieldy and inert side” while “time was the active and dynamic side in the battle, the side always on the offensive.”⁸⁴ Bauman describes modernity as a process of *liquification*: the structural to the atomised, the social to the individual, and the “lightness and fluidity of the increasingly mobile, slippery, shifty, evasive and fugitive power.”⁸⁵ However, this liquidity is far from being free flowing, as it relates to what Rosi Braidotti calls a “highly controlled system of hyper-mobility of consumer, goods, information bytes, data, and capital whereas people do not circulate this freely.”⁸⁶

Braidotti’s description places people and bodies outside of hyper-mobile informational and capital flows, on the side of solid masses. Yet, I wonder how technological or biotechnological processes might be liquifying bodies and masses in a more intimate sense? Data flows from the body circulate freely even while in a state of immobility or rest, perhaps creating split tracks between solids and liquids, overlaps of slow and fast speeds, at the same corporeal site?

Dissonances between time and space, velocity and mass, are mitigated by another important quantity: information. Information flows and circulates around the spatial nodes of daily life: circuits of table, chair, bed, bath and even the mass of my body sitting at my desk feeling *solid* and *stolid*. This flow can be complex, intimate, and transactional: “I miss you” in bed, “your balance is outstanding” on the chair, “with closed eyes, turn your attention to your breath” in the bath. *I oscillate between swimming, drowning, and floating*

in informational flows. Simultaneously hyper productive and slow, agitated and elated, agile and resistant.

Flows of complex, dynamic, or discordant information are not new; what is different is the extent of being kinesthetically and somatically *elsewhere* while crossing new technologically mediated social, emotional, temporal, and economic thresholds. *I felt this 'elsewhereness' expand as my screen time doubled and then tripled; this felt less like a dramatic spatial shift than an evening out of the tones of everyday life, a day-to-day beigeness signaling entropic loss. However, deceleration also brought a new attuned solitude, self-care, and opportunities to process pre-existing trauma; hence, a new 'hereness'.*

Every day brings new imbrications of the biological, social, emotional, psychological, technical and technological. New intimacies and process-heavy entanglements make it harder to separate these out into discrete entities or qualities such as organic and inorganic, human or nonhuman, bodily or not bodily, etc. My work as an artist and researcher has moved away from genealogical determinants or the tendency to orient in complex informational fields by referencing places of origin in time and space; other tools are needed to make sense of a complex lived topology of shifting meshes and blurred boundaries.

One way of staying grounded in this topological flow is to pay attention to corporeal or psychological resonances, giving materiality to affect and developing critical and perceptive capacities. Rosi Braidotti calls for *embodied and embedded* perspectives, and positions the 'Critical PostHumanities' as "contiguous with, but not identical to the epistemic accelerations of cognitive capitalism...it functions at different speeds, moves at different timeline and is fueled by radically different affects."⁸⁷ Braidotti considers "feminist perspectival knowledge practices" as part of a neo-materialist philosophy which uses the capacity *to affect and be affected* to work out complex material relationalities.⁸⁸

A critical, creative, and self-reflective practice helps me work out meshes of material relationality that keeps me from floating into a dissociative state or fantastical space. There is re-occurring anxiety about information overwhelm, cognitive accelerations

that could also crash and burn, speeds that move at the rapidity of something being destroyed.

Writing on 'Liquid Modernity' in Frieze magazine, Carson Chan describes this state of inundation or submergence astutely:

Beneath every object's surface is an interlace of networks shifting against the forces of our values, transactions, correspondences, standards, laws and so on. Our digital abundance has produced visual epistemologies of new oceanic depths. Objects have become clickholes of unfolding information, an unending chain of references that make the object at once more defined and less bounded. Looking at something, even intently, no longer tells you much about it.⁸⁹

How to live in or as a liquid state? In her PhD thesis 'Wet Rest: Speculative Ontologies of Floatation,' Lucy A. Sames explores practice-led and embodied research through the use of floatation and sensory deprivation chambers, innovating a "redeployment of this therapeutic technology for the harnessing of its corollary effects—kinesthetic disorientation, somatic misperception and spatio-temporal distortion."⁹⁰

Sames' research on floatation correlates with Brigid Crone's analysis of immersion and liquidity as describing the biopolitical condition of being submerged or adrift in digital, financial, or media flows. In 'Liquid States and the Image,' Crone writes on being immersed in a datafied and media-laden culture. "Liquid states," she writes, "provide a powerful metaphor for describing the flattening of distinctions between work and leisure, and between body, image, and data."⁹¹ At work or play, we find ourselves immersed in a biopolitical or techno-ontological fluid, a media water-world without end.

Following Crone's digital, mediatic, biopolitical concept of immersion, how do we separate inside and outside? What is liquid and what is body? Bauman describes liquidity in terms of: "fluids, so to speak, neither fix space nor bind time... fluids do not keep to any shape for long and are constantly ready (and prone) to change it; and so for them it is the flow of time that counts, more than the space they happen to occupy; that space, after all, they fill but 'for a moment'."⁹²

Information is fluid and passes over solids as it relays, emits, and receives; it also has the ability to liquify solids into data flows. However, information is not necessarily a

flat ontology as it is prone to hierarchical organisation with regards to what is quantifiable or not, useful or not useful, signal or noise. What is considered datafiable extends with new forms of pattern recognition, biometrics, wearables, and the use of biosensors. Information has endless plasticity, rapidity, immediacy (liquids) but also captures, measures, and produces or impacts material states (solids). It is possible for certain solids (metals) under the right pressure to exist in both a liquid and solid form, what is known as a “chain-melt” state.⁹³ Perhaps this improbable melding of liquids and solids in a “chain-melt” is appropriate for thinking of the body in between solid (matter) and liquid (informational) states?

Feedback loops between information and matter, data and body, produce “chain-melt” states of fluid and solid, material and immaterial. As Patricia Clough writes “bodily practices themselves instantiate as data, which in turn produces a surplus of bodily practices...so too the difference of the inside and the outside of the system is undone and a question is raised as to what environment is.”⁹⁴

The outer is nested into the inner, and the inner extends outwards. As Patricia Clough writes, “digital media and computational technologies, neoliberalism, and biopolitics continue to reach into the ontological grounds of human subjectivity and sociality, both in their operating on the nonconscious, bodily responses or affect and in their flooding the domain of connectivity with other than-human-agencies or datafication.”⁹⁵

Undoings of inside/outside

Undoings of inside and outside. The body is an environment nested inside another body. In a closed posthuman loop the body instantiated as data in turn acts upon, designs, or influences bodily states. Benjamin Bratton references an extreme example of this feedback loop in a Microsoft research project called MyLifeBits, which asked: “what if everything you ever saw, heard, and felt, and every object you ever touched, every location you ever shadowed—every externally trackable experience—could be recorded at some incredible lossless resolution and fidelity, fed into practically infinite storage, and

available to recall and replay at any time?"⁹⁶ Bratton speculates that the infinite metadata that this constant recording produces might result in greater self-awareness, but also possible digital psychopathologies. He goes on to pose the question:

Would memories of memory become unwound such that the consciousness of a situated subject is forever unwound as well, leaving little piles of neurofabric throbbing in the feedback of its own disassembly? If so, then can those be rewoven into different, less individuated User-subjects, after the fact?"⁹⁷

While this example of infinite autobiographical looping is quite funny, there remains something unsatisfying or cavalier about thinking about humans as *unsituated* piles of throbbing neurofabric to be cut and stitched or rewoven. However, for Bratton, the 'User' is a technical position in a system, and not an ontological category. As he writes "the User is not a type of creature but a category of agents; it is a position in which it has no role or essential identity."⁹⁸ The user layer is already populated by nonhuman entities such as bots and algorithms, which account for a large amount of the internet's energy expenditure. Bratton argues against anthropomorphic humanism and human-centered design; this user could also include animals, swathes of the rainforest, corporations, and other nonhuman agents.

Bratton is keen on stepping over human-centered design, which he sees as rooted in dubious Enlightenment myths, towards "synthetic User subjects for which another geopolitics is derived."⁹⁹ His view is not without a kind of posthuman ethics, however, as he says on his twitter feed, "from the Vitruvian Man to Facebook profiles, centuries of 'human-centered design' (HCD) have brought more usable tools, but in many important domains design is far too psychologising, individuating, and anthropocentric without being nearly humane enough."¹⁰⁰ Responding to Bratton's de-centering of human users, Patricia Clough writes:

What it does mean is that the human user and human-user-centered design have been displaced by a focus on the other-than-human users of The Stack. That is to say, human users have been decentered and deprivedged and, for Bratton, this deprivedged human subject does not offer the best perspective on The Stack.

He hopes instead that the other-than-human users can show 'a different way for us to be human and not.'¹⁰¹

However, it seems rash for Bratton to throw psychology in the same heap with Vitruvian Man and Facebook, particularly when there is so much that is under-thought as to what the psychological or community-based implications of non-human centric design might be or become. Of course, human scaled design is used on platforms like Facebook as a neoliberal container that favours individualisation, atomisation, and other features of liquid modernity. Still, there is something flippant and ableist in Bratton's dismissal or impatience with psychological layers, even considered as substrates of the 'synthetic User.' Yet for Bratton, users carry other users, and therefore cannot be categorical identities themselves:

Ensnared one within the other, the 'user' of each design encapsulates another while itself being encapsulated, infecting and infected at once, integrities crumbling... far weirder than Larry Smarr's gut microbes, nested parasitic substrata are in some cases five levels deep inside the other (fifth order hyperparasitism): animal inside animal inside animal inside animal inside animal, user inside user inside user.¹⁰²

In Bratton's organismic model of nesting, it is not so much a question of separating inside/outside, but inside and more inside and more inside. However, I wonder if this analogy glazes over certain assumptions regarding a host's wellbeing in this nested chain. What about host-damage, exhaustion, predatory parasites, discomfort, and gut pain?

Bratton's model of nesting is not without some appeal, however, as it also implies a chain of embedded intimacies, no longer maintaining clear boundaries or subjectivities, yet not resolved into a hybrid state or symbiosis. Nested intimacies can also be a way to talk about an 'I' in terms of what is already imbricated on the inside and outside, or inside and more inside. For example, the use of increasingly sophisticated data captured through digital surveillance and biosensors towards ever more granular or personalised specificity can make this nesting a kind of *hyper intimacy*.

I use *nested intimacies* to think through complex chains of embodiment, datafication, trauma, and psychological and physical wellbeing. *Nesting* also evokes both

the sense of preparing an embodied ground for oneself and also an embedded and technical harvesting of different forms of information into one another; nesting can be neutral, beneficial, contested, parasitic or traumatic. It can include human, nonhuman, and other-than-human agencies. *Nesting intimacies* has given me a way to organise my research and practice across several axes, bringing intimate sites into my research, and vice versa, without risking fragmentation.

Intimacy in research also draws on the idea of ‘intimate scholarship’ from a methodology developed by researchers Hamilton, Pinegar, and Davy to explore the role of educators in an academic context, through a “grounding in a relational ontology, a focus on the particular, establishing knowing through dialogue and being conducted in a space of vulnerability and openness.”¹⁰³ *Nested intimacies* becomes a way of conducting research and practice in a space of vulnerability and openness, while *intimacy* reaches beyond the ‘I’ as a biographical, neoliberal, or anthropocentric container towards a relational matrix of close proximities and imbrications.

Following Rosi Braidotti’s *posthuman knowledge*, I approach the autoethnographic with “transversality as the operational concept that helps to conceptualise the subject across multiple axes,”¹⁰⁴ thereby de-centering the notion of the ‘I’ while attempting an intimate form of address. My artistic practice considers both positive intimacies and harmful proximities in relation to traumatic embodiment and digitalisation. These include positive relational or healing modalities such as listening, touch, and other empathic practices. However, my work with trauma as embodied memory considers the close proximities of parasitism, traumatic others, and neoliberal capture. These reflections begin with my lived experience as a woman with C-PTSD learning to navigate digital mental health and wellness during pandemic time.

As a ‘User’ who experiences traumatic stress, I am constantly asking of my environment: *how will I metabolize this information? Does this nesting benefit or threaten me?* Moreover, without grounded perspectival difference which includes emotional, neurological, and psychological diversity and inclusion, what does posthumanism without human-centric design become or *feel* like? Should design solutions aspire to what Bratton

calls the *technical positions of the user*, existing outside of human-centric parameters and human time? Or will design solutions incorporate increasingly emotional intelligences?

Posthuman bodies in time

Located between the highs and lows, the schizoid speeds and stasis of the “Fourth Industrial Revolution and the Sixth Extinction,”¹⁰⁵ Rosi Braidotti’s posthuman looks away from European humanism and anthropocentrism while claiming an affirmative ethics through an *embedded and embodied* perspective. Learning to become active within states of exhaustion, loneliness, fatigue, fear, and terror; riding out the booms and busts, finding other temporalities for oneself within the dissonant time signatures of liquid modernity: this is a part of *posthuman knowledge* for Braidotti, who describes Critical Posthumanities as combining

...understanding and knowledge with training and pastoral care, thus fulfilling both a critical and a healing function in relation to the negative instances of injustice and dispossession, pain and hurt, exhaustion and anxiety, that mark the posthuman convergence.¹⁰⁶

For Braidotti, the posthuman convergence includes psychological and neurological states like overwhelm, anxiety, trauma, and very real entanglements with the nonhuman and the inhuman forces in technology and politics. Within the post-human convergence, traumatic memory resonates as bodily materiality and as somatic information, not simply as *noise*.

In her talk for ‘Digital PTSD’, an online program given at Castello di Rivoli Museo d’Arte Contemporanea, Bracha Ettinger claims that “psychic time” is at stake in the acceleration of digital time, hyperactive connectivity, and the “obsession with immediate jouissance” that we encounter in the “digital gaze.”¹⁰⁷ Deceleration, Ettinger tells us, is needed to allow us to develop care, become concerned, to witness, to develop empathy, and to “reopen the future.” As Ettinger says: “the digital gaze numbs us and captures our phallic narcissistic urges and lusts, and uses our ancient archaic mechanisms, where empathy is just reflective automatic empty empathy.”¹⁰⁸

Following Ettinger, a slowed down time of sustained engagement and deceleration is necessary to develop real empathic engagements, and to counter the scopophilic and sociophilic screen gaze. A socially constructed phallic screen gaze continuously jumps over representations of pain, trauma, and forms of restorative or empathic care, particularly as associated with feminine modalities. Empathic capacities might be a healing other, therapist, friend or slightly more parental version of yourself who listens or receives, never coddling or pitying you (as these secretly wish to silence you). This can be a learned empathic technic that also opens or augments digital spacetime towards a slowed down space of listening and receiving, or empathic witnessing.

On the subject of creating other temporalities, Alison Kafer writes about *crip time* as a way of imagining an alternate futurity, in contrast to *curative time*; “the questions animating a curative temporality include: Were you born that way? How much longer do you have to live this way? How long before they invent a cure? How long will a cure take? How soon before you recover?”¹⁰⁹ As Kafer explains, these questions always imply that there is no future for those who suffer from disabilities, rather than the *curative* temporality which would restore what is considered typical. Quoting Simi Linton’s *Claiming Disability: Knowledge and Identity*, Kafer writes:

The medical model of disability frames atypical bodies and minds as deviant, pathological, and defective, best understood and addressed in medical terms. In this framework, the proper approach to disability is to ‘treat the condition and the person with the condition rather than *treating* the social processes and policies that constrict disabled people’s lives.’¹¹⁰

Following Kafer’s connection between disability and time, the challenge is to reclaim other temporalities, to put a stop to the endless plasticity and flow of technologised time. What Kafer calls ‘strange temporalities’ come into being in divergences from linearity, dissonant pacing, strange double-times, being in the past, and out-of-syncness: these are often used to describe traumatic memory.

It is not only artists and theorists looking at, and working with, alternate digital temporalities, however. The commercial world of digital mental health and wellness tech

is situating itself to become a site of disruption by tech firms.¹¹¹ Digital health and wellness services do offer slowed down digital time, human-centric, and responsive media, but also open the body to commodification and forms of behavior manipulation.

Human-centered design in the form of biofeedback or neurofeedback, health and wellness tech, sleep tech, and digital mental health, promise to use technologies to create personalised or responsive environments that positively modify the environment or the behavior of a human user through such things as biosensors, AI-assisted therapies, and other biotech innovations. Nichol Bradford, co-founder of Transformative Technology, believes that these forms of “exponential tech can and should be used to help close the gap between the human mind and technical capacity... exponential technologies present an opportunity to diagnose, improve, and expand human inner capacity at a scale not possible even 10 years ago.”¹¹²

Analogies between psychological functioning and computational or informational metaphors are not new. Biofeedback and EMDR (Eye Movement Desensitisation and Reprocessing) both use cybernetic concepts of feedback, information processing, and an organism’s tendencies to seek self-regulation. Biofeedback and neurofeedback work according to the principle that self-observable and quantifiable information can be fed back in a loop in which the observed measurability of the condition changes the organism’s behavior. These ideas are in line with second-order cybernetics and autopoiesis, which emphasise self-observation, autonomy, and homeostasis.

Patricia Ticineto Clough writes about her frustration with autopoietic concepts, stating that “as all living systems come to be defined as autopoietic, the body-as-organism becomes the figure of life-itself.”¹¹³ Characterising life as autopoietic, however, “does not account enough for the transformation and complexification of life.”¹¹⁴ Clough argues that architectural algorithms are displacing cybernetic concepts which still hold on to “the figure of the human subject and the insular thermodynamic system”¹¹⁵ moving instead towards a nonrepresentational, nonhuman, and indeterminate affect-based economy. Algorithmic logic, Clough writes, not only captures or quantifies noise and data from bodies but “seeks to modulate the emergent forms of sociality in their emergence.”¹¹⁶

Traumatic temporalities

In writing on trauma, pain, and its relationship to knowledge production, Mariana Ortega proposes

that the punctum in our words, in our theories, is that wound that makes us create knowledge informed by that very wound. It is what calls us to theorise from experience (from the inside even though the inside is no longer the inside from the traditional subject/object, inside/outside) and to demand that our thoughts, our theories, our ways of knowing, what fancily we call our epistemologies, do justice to the lives we live.¹¹⁷

I began much of this research focused on the question of how trauma impacts epistemology and the challenges of inhabiting the wounded space that Ortega writes about in a creative and critically engaged way. Theorising from a place of pain to counter *epistemicides* by a hegemonic culture with its roots in colonial violence that has also denied the long-standing impact of that violence. *Epistemicides* persist in archives as silences, omissions, or absent persons/events/places. Boaventura De Sousa Santos defines the term *epistemicide* as that which results from unequal exchanges between cultures or groups. He writes:

Unequal exchanges among cultures have always implied the death of the knowledge of the subordinated culture, hence the death of the social groups that possessed it. In the most extreme cases, such as that of European expansion, epistemicide was one of the conditions of genocide. The loss of epistemological confidence that currently afflicts modern science has facilitated the identification of the scope and gravity of the epistemicides perpetrated by hegemonic European modernity. The more consistent the practice of diatopical hermeneutics, the more destabilising the image of such epistemicides.¹¹⁸

Karyn Y. Freedman argues that to give the experiences of survivors of sexual violence epistemic value, a theoretical distinction should be made between the shattered self and 'the shattered worldview'. This distinction has to do with the reasoning that the first case refers to the emotional or physiological effects of psychic trauma, while the latter reflects a paradigmatic shift in the way trauma survivors view the world, signaling that a

cognitive change of epistemic significance has occurred. She goes on to explain that the ‘shattered worldview’ often goes against what is considered normal, quotidian experience in many parts of the world, thus the voices of survivors are often repressed and unheard. “What these challenges show is that while there is a whole host of good reasons to reject the alternative worldview that grows out of the experience and awareness of sexual violence, none of them is epistemic.”¹¹⁹

In her book *Aftermath: Violence and the Remaking of the Self*, Susan Brison makes the case that the epistemic devaluation of traumatic memory has been a longstanding problem in Western Philosophy. She argues that the Western tradition has generally been loath to associate itself with the body, a genealogy she traces from Plato’s dualistic view of the body as imprisoning the soul to John Locke’s separation of consciousness from bodily identity.¹²⁰ For Brison “the bodily nature of traumatic memory complicates a standard philosophical quandary concerning which of two criteria of identity—continuous body or continuous memories—should be used to determine personal identity over time.”¹²¹ In her own work, Brison has attempted to assimilate the personal and political, the somatic and theoretical considerations of traumatic memory, drawing from her experience as she works through the traumatic aftermath in her own life.

I wonder about the epistemicides and omissions in the archive to come. As bodies are mapped and datafied, will pain emerge out of nonrepresentation, or trauma from alleged unspeakability, to be quantified and recoded as information? Is this a form of other-than-human witnessing or its absence?

However, since I have been writing this I have found there is a whole industry around trauma treatment and therapy online, particularly in the spheres of digital mental health/wellness and digital education. Now that my algorithmic profile has identified me as someone interested in trauma or perhaps even suffering from trauma, my social media is inundated with trauma-related content. Some of this I click. Some I find helpful. Some I try out. Some I find beneficial but strangely alienating, lacking human relatability or complexity. Am I being manipulated into a state of relaxation? Is it behavior modification? Neo-liberal self-mastery? Talk therapies, somatic processing, guided meditations, educational conferences. It is as if I spent years avoiding dealing with traumatic memory

only to step out into a digital marketplace of trauma soothers. Where to take my trauma I wonder? I shop around. Sometimes it helps and soothes, sometimes it confuses.

Digital trauma

In addition to adapting to dissonances between accelerated and decelerated states, pandemic time brought new solitudes and increased sensitivity towards my bodily and mental health. As a woman with C-PTSD, I learned to attend to my self-care by wading deeper into digital flows: online therapy sessions, trauma processing resources, technodelic meditations, virtual yoga classes, an EMDR app; my mental health-care is now rooted in digital mental health or wellness tech. Many of these approaches teach me to *stay in the body, be in the body, be in the breath*; yet none of these have been through modalities where I can orient myself proprioceptively or access through touch. Still *I feel myself in my body as I take a deep breath for 1, 2, 3.*

Learning to heal or live with trauma and adapting to the digitalisation of life. These different modes or life skills began to concatenate in my mind, forming strange twists, areas of overlap, dissonance and divergent doublings. Learning to live with trauma is learning to come into the body, specifically, a wounded body; digitalisation offers a radically different sense of embodiment or disassociation distributed across an immediate information-affect axis. What could possibly be shared between a conversation between learning to live with trauma and learning to adapt to digitalised life? Certainly, my need to ask this question itself testifies to the techno-ontological enmeshment of the technologies at hand with my emotional, neurological, and somatic *processing*.

I stumble on the word 'somatic' as it originates in the Greek word 'somatikos,' which was held as being distinct from the psyche and the spirit. As Elizabeth Grosz explains, "Plato claims that the word *body (soma)* was introduced by Orphic priests, who believed that man was a spiritual or noncorporeal being trapped in the body as in a dungeon (*sema*)."¹²² *Perhaps this dualism continues in the divergence from purely somatic therapies from psychoanalytic and talk-based approaches?*

A conversation is forming in the way that learning to heal from trauma is also helping to orient me in a new vertiginous technological horizon. *Staying in the Body. Recoding psychic skin. Metabolizing the traumatic other. Reprogramming states of sensory overwhelm.* These are some of the difficult tasks and life skills learned by those who have to make sense of human violence and its aftereffects. *Restoring reliability and trust. Calming the nervous system. Holding the breath for 3 while focusing to create an 'even' tone throughout the body.* What can post-traumatic stress or memory teach one about embodiment in a digital context? As Ortega writes:

The bodily memory that sometimes appears and disappears in the form of post-traumatic stress disorder is one that cannot be ignored. It is also one that points to the close connection between self and embodiment.¹²³

I have been aware for some time of the extent to which C-PTSD impacts the way I interact with media and internet culture in terms of my self-representation, tendency towards overwhelm, and general anxiety about lack of consent. Trauma-informed approaches are generally not applied to digital design and technology practice. However, a related and perhaps stranger conversation takes root regarding traumatic experience and the expanding role of human-centered design in preventing digital information overload.

I find a scattering of researchers working on trauma-informed approaches to data collection or datafication, including Grace Quantock, a psychoanalyst and researcher at the South West Creative Technology Network, whose project 'Traumula: A Trauma - Informed Development Matrix for Creative Technologists' researches ways digital technologies shape the experiences of users with trauma. In a video interview with 'The Pervasive Media Studio', Quantock says:

Many layers of data are often feeding into an individual's experience, trauma, or difficulty processes something... these could be cultural/relational, intergenerational, socio-historical, transpersonal, transhistorical layers... that could be impacting each individual process and interaction... and all these interweaving layers of story, experience, and understanding can contribute to overwhelm. This overwhelm can trigger a trauma response of fight/flight/freeze/friend/flop which generally disengages us relationally. So when

that happens we cannot consent or take choiceful action anymore because we are not there... When you have been scrolling for hours and you kind of have fallen into the internet... and you come to and realise 'wow I have been scrolling for really far too long'... what happens there is there were not clear choice points, there were not clear options when we were falling in and scrolling.¹²⁴

Quantock goes on to say that this is what is difficult for users with post-traumatic stress: *feelings of powerlessness, choicelessness, and the threat of being overwhelmed.* Is there a real or speculative point when digital technology or information / sensory overwhelm can pierce the psychic skin and become traumatic? In the context of online research, I have felt overwhelmed by the sheer quantity of information and its flexibility, and find this leads to a state of hyperlinked exhaustion, disassociation, and sometimes psychological symptoms similar to re-traumatisation. Are there online research design strategies that prevent states of psychological and mental dissolution? Perhaps it will take a new generation of responsive text analysis and algorithmic fine tuning to make digital tasks more manageable, less overwhelming, less prone to fragmentation? *Overwhelm. Fragmentation. Dissolution. Inability to process or decode information. Disassociation.* These are all states I have felt and associate with post-traumatic stress and traumatic memory.

Algorithmic skin, psychic interface

What potential states of *dissolution, disassociation, fragmentation, exhaustion, information or sensory overwhelm, feelings of powerlessness, feelings of choicelessness,* might become new sites of *digital psychopathologies* or *digital traumas*? Can digital trauma result from commonplace digital infrastructure and design elements? This quotidian digital-trauma-by-design excludes more obvious digital traumas, such as: algorithmic debt collection, online bullying, racist algorithms, phenotyping, identity theft, deep fakes, nonconsensual image sharing...the list goes on. Perhaps more psychotherapists and psychologists should be working on the etiology of digital trauma. After all, railway spine was also technologically caused and a result of the safety design failures of its day. Some media theorists working at the intersection of psychoanalysis and

digital media have considered the impact of commonplace digital media interactions on the psyche, in terms of blurring boundaries between human, nonhuman, posthuman, and inhuman actors.

In *The User-Unconscious: On Affect, Media, and Measure*, Patricia Ticineto Clough proposes a 'User-Unconscious' to "rethink subjectivity and sociality in the shift from the private and the public to the personal and the networked."¹²⁵ Clough explains how these shifts are mitigated by neoliberal capture of computational technologies such that the embodied / human 'I' becomes the "YOU" of social media (as in the YOU of YouTube) whose habits and behaviors often fall beneath consciousness, into what Clough would term "nonconscious affects."¹²⁶ As a psychoanalyst and media theorist, Clough views the unconscious as having "an originary technicity" and relationship to the nonhuman.¹²⁷ Referencing Harold Searles, she writes "this is not merely a matter of conceiving the unconscious processes beyond the human subject or its body, but rather of reconceiving the relationship of the psyche to the other-than-human or 'the nonhuman,' as the psychoanalyst Harold Searles described it, in recognition that the human's relationship to the liveliness of the nonhuman never fully comes to an end."¹²⁸

According to Clough, the unconsciousness is already meshed or entangled with the nonhuman or other-than-human in the form of preconscious childhood memories as well as through traumatic experiences which 'undo the psychic skin', referencing psychoanalyst Sue Grand's "thing-self."¹²⁹ Clough writes:

I would propose that digital media and computational technologies may well be eliciting the human user's thing-self, giving shape to what I am calling the user unconscious in order to point to the activity of the unconscious in relationship to the collapse into the YOU, of the I and the cloud of digital traces, including the data of a worldly sensibility. These, no matter how disavowed, are becoming an intimate part of the I, evoking a thing-self that opens the unconscious both to the liveliness of other-than-human actants and to reformulation of embodiment in the YOU. That is to say, the YOU refers to that part of the I that is not humanly embodied, not so much a digital disembodiment, but an other-than-human embodiment. The I is not simply humanly embodied and, as such, is not one with organism. Embodiment cannot be contained within the organic skin. In this way, digital media and computational technologies also may be transforming the meaning of trauma, pointing not only to the traumas of code but also to the

traumas of abuse and violence when the I is not evenly embodied and not one with the organism.¹³⁰

Writing on psychoanalysis and digital culture, Jacob Johanssen focuses less on the structure of the psychic unconscious and its interplay with digital nonhuman, posthuman, or inhuman actants, but takes a Freudian reading of the function of the algorithm. Johanssen makes an analogy between personalised algorithms and Freud's theory on the structure of the ego. According to Johanssen, algorithms make computation and the mathematical substrate of the internet readable and "articulate, similar to a kind of algorithmic superego, that they know what is best for us, and we believe them."¹³¹ Algorithmic skins also take on some functions analogous of the ego in filtering, protecting from overwhelm, making sense of sensory data, separating information and noise.

Referencing Elsaesser's "Freud as Media Theorist: Mystic Writing-Pads and the Matter of Memory," Johanssen writes, "Freud conceptualised consciousness in terms of what he would later refer to as the ego, that is, it works as a protective shield against sensory overload that prevents perceptual overstimulation."¹³² For Freud, the ego is precisely this living interface working to protect the psyche from overstimulation and the threat of traumatic information or noise. A skin-like boundary, psychic membrane, a material threshold, a living interface oscillates between serving as an expansive and connective tissue, and contracting to protect one's self from the traumatic other. In 'Beyond the Pleasure Principle', Freud writes:

We describe as traumatic any excitations from outside which are powerful enough to break through the protective shield. It seems to me that the concept of trauma necessarily implies a connection of this kind with a breach in an otherwise efficacious barrier against stimuli.¹³³

Algorithms organise news feeds, filter out information, keep track of friends, index preferences, track and predict behavior. According to Johanssen, they also "individuate" the experience of the user in an otherwise purely mathematical or datalogical substrate.¹³⁴ As Johanssen points out, this *individualising* and *disindividualising* occurs at the same time; on one hand seducing the user with platform identities while generating hidden

algorithmic identities for monetisation and predictive analysis;¹³⁵ algorithmic identities and user skins, instances of infinite digital memory and forgetfulness or forgetability create “double archivisation.”¹³⁶ For Johanssen, this relationship to “services that mine our data resembles a perverse relationship in which we are loved/valued and abused at the same time.”¹³⁷ How this data is compiled or aggregated, in terms of phenotypes, racialised data sets, markers of physical attractiveness, income levels, sexual preferences is not readily available for social, critical, or psychological analysis. As such, the algorithmic skin also conceals an abusive and potentially traumatic function.

Information, its capacity to be stored, destroyed, or extracted from noise, is inextricably tied to archiving processes; archival loss exerts a force of inchoate destruction and the inability to make sense of events. Traumatic stimuli overwhelm psychological capacities of memory processing leaving only uncoded affects on the *body proper*. In *Archive Fever*, Jacques Derrida describes the process of archiving as “entrusted to the outside, to an *external* substrate” and not “to an *intimate* mark, right on the so-called body proper”; adding “but where does the outside commence?”¹³⁸

The question of where the outside commences is continuously felt and negotiated in living with traumatic memory and adapting to digitalised life. As an intimate mark on the body that cannot be communicated or ‘archived’, trauma and intimacy fold into the supposedly untranslatable and private domain of the body, conventionally held to be outside the realm of knowledge production. This silence or unspeakability is countered by postcolonial critiques in trauma theory which counter non-representation by focusing on narrativisation and archival activism. However, in the technical and techno-ontological questioning of what is inside / outside, or in the undoing of external and internal boundaries between human and other-than-human agencies, the question remains of the fragility of the ego skin in traversing posthuman thresholds and speeds, and what digital traumatic breaches might be or become.

Conclusion

In this section I have used an auto-ethnographic approach to consider undoings between bodies and environments, inside and outside, self and other in digital media systems. I have conducted an analysis that examines digital media in relation to traumatic thresholds. I have created space for the possibility of traumatic breaches within posthuman or postbiological becomings. I reference the work of a number of theorists working at the intersection of psychoanalysis and digital media to counter a universalist approach that would regard these considerations as hyper-local contingencies to be rendered unimportant or invisible. This disregard for psychological contingencies within posthuman assemblages is typified in Benjamin Bratton's decentering of human users in global computational systems. I offer this analysis on the relationship of traumatic stress and digital media from the perspective of digital inclusion and also to contribute to greater sensitivity around the possibility of traumatic responses in posthuman or postbiological narratives. These considerations reorient default conceptions of the human body towards its vulnerableness and susceptibility to trauma. Traumatic responses call attention to the need for self-differentiation, refusal, choice points, and consent within posthuman or more-than-human assemblages or ecologies.

INTERVIEW WITH GRACE QUANTOCK

As part of my research on expanded trauma-informed approaches to digital media, I interviewed Grace Quantock, a creative technologist, psychotherapist, and trauma specialist. She is developing a framework called “Traumula: A Trauma-Informed Development Matrix for Creative Technologists” as a talent fellow for the South West Creative Technology Network. I spoke with her about how digital media lacks architectures of choice, clear entrances and exits, and how to imagine digital intimacies differently. We discussed the dissociative aspects of digital media, ranging from retraumatisation, disembodiment, to pain management. Lastly, Grace spoke about frameworks for navigating overlaps and differences between issues of digital inclusion, diversity, and social justice.

My conversation with Grace Quantock addressed the importance of architectures of choice, agency, and personal mapping in navigating physical and digital spaces. She discussed invisible layers of racism, ableism, sexism, homophobia, and other forms of discrimination that make up the datalogical layers of digital media but also physical, institutional, and social reality. We talked about uncomfortable intimacies with digital media, and she compared this to a feeling of fake or untrustworthy intimacy that comes from being in spaces like hospitals. We also touched on trauma-informed approaches in relation to frameworks that prioritise consent in kink and BDSM practice.

Notes on appendix

I contacted Grace to learn more about her work with ‘Traumula’ and we began a series of email exchanges that led to an interview. I intended the interview to become the basis of a meditative audiovisual work as I like her spoken word material and approach to mindfulness. Instead of bringing one out of the body, Grace’s guided meditations were about locating oneself in one’s body. As she describes in my interview with her:

I know when I used to do teaching, we talked about meditations and mindfulness practices. And I’m always really careful to locate those in us internally. Because

often when you do a mindfulness practice, it's kind of like, imagine a place, often a natural place like a meadow or a beach or a forest...and go out to that place...It was very dissociative. But what I try and do is 'find a neutral space in your body', like find a space there and we are going to find a world that lives inside you, which you can do stuff in.¹³⁹

I did not end up developing an audiovisual piece with Grace as we both felt that the recorded interview was extensive and complete in its own terms. However, much of what we discussed in the interview became the basis of 'strangely intimate diagrams'. The interview helped develop my thinking around choice architectures, consent, and human-scaled interventions in digital systems, which I reflect in the diagrammatic works that emerged through our discussion.

A full transcript of my interview with Grace Quantock is available in the appendix as our conversation has a lot of value in light of this PhD's focus on rescripting agency, discovering modes of care, and bolstering relationality as co-vulnerability in digital systems. My discussion with Grace and consideration of her work in trauma-informed approaches to digital media, influenced the course of this study and helped me in my journey towards developing digital retooling as a methodology and digital aftercares as a propositional and tangible postscript of traumatic engagements with digital media.

Diagrammatic approach

I created three diagrams based on my interview with Grace that draw on the important threads in our discussion. These diagrams position my work as an artist in relation to local and nonlocalisable elements in digital media, grounding my practice between the strange pull of abstract and personal, intimate, and disparate connections. As part of this research, I investigated diagrammatic thinking and processes.

A diagrammatic approach is useful as a visual and cognitive tool that expresses heterogenous relationships and is able to convey or translate information across different media. Susanne Leeb identifies two broad concepts or traditions that inform the genealogy of diagrammatic thinking. The first conceptualises diagrams as a way of organising, elucidating, and structuring thought—such as in mathematical diagrams, pedagogical aids,

information design, and cosmological modelling. The second approaches the diagram as an open site, where connections between diverse forces are made in non-localisable space, with elements that are translatable between different media, and in an open timeframe. As Leeb writes, if “the first concept of the diagram is retrospective—by means of diagrams, a complex thought process or argument can be composed or a set of circumstances.”¹⁴⁰

Jakub Zdebik who has written extensively on Gilles Deleuze and the diagram, writes that abstraction of traits in a diagram is essential because “they can be applied-beyond a single specific state—to heterogenous situations,” and thus “the traits of the diagram are peripatetic.”¹⁴¹ To make this clear, Zdebik quotes Deleuze writing on Foucault: “the diagram of the abstract machine is the map of relations between forces, a map of destiny, or intensity, which proceeds by primary non-localizable relations and at every moment passes through every point, ‘or rather in every relation from one point to another’.”¹⁴²

A diagram helps orient oneself within an abstract space, draw out relationships, intersections, and oppositions but without the closedness, supposed neutrality, or authority of a map. The diagram is a way of capturing, unfolding, and understanding through polyvalency, unresolved states, and multiplicity. My diagrammatic works are aids in understanding the play of forces around my digital media practice. At the layer of affectual and bodily resonance, digital media often feels disparate, disassociated, and somewhat chaotic. However, these abstract relationships also register as lived experience in ‘nested intimacies’ of financialised, digital, and bodily flows.

During this time, I gave a workshop on diagrammatic approaches as generative artistic practice and as a way to counter information overwhelm in January 2020, in collaboration with postgraduate RCA student Adrian Gouet, as part of the Student Union’s workshop series.

Strangely intimate diagrams

My use of the diagrammatic plots and positions my work as a digital artist within the abstract and localised flows that digital media produces. This mapping signals coming out of a fragmentary understanding of digital space as grounded in abstract flows of computation and capital. As part of the development of digital aftercares, this captures my evolution from engaging with plug-and-play digital media systems towards a speculative post-scripting that retools and opens alternative pathways of care.

Drawing from my interview with Grace Quantock, 'strangely intimate diagrams' takes direction from kink practice which centers architectures of choice and consent to safeguard risks, through processes of debriefing, safe words, and aftercare. Aftercare is a tenant of the kink community and is essential for processing experiences, recalibrating or regulating one's emotions coming out of disassociation, and contributing to a feeling of intimacy, safety, and care.

My diagrams combine intimate images to both mirror and counter the strange intimacies that digital media produces, as well the necessity of moving from content (interface) to structure (infrastructure, social relations, capital). These diagrams play on the idea that the relational choices and decisions that arise in erotic and intimate encounters are what safeguard consent, and, therefore, are to be read and evaluated as active negotiations. Hence if the structure or choice architecture changes information is read or perceived differently. My discussion with Grace Quantock also addressed precisely this need to move away from a narrative focus in trauma-informed approaches, by not simply speaking to the content of traumatic experience (the specific incident a trauma survivor has lived through) but rather the design and infrastructural elements that can become triggering in architectures of choice that diminish or obscure agency.

These strangely intimate diagrams emphasise the importance of personal mapping, embodied understandings, and ethical considerations that make up my digital arts practice and emerge through relationality, lived experience, and negotiation with human, nonhuman, and posthuman agencies.

As nested intimacies, these diagrams influenced and prepared me for the creation of strangely intimate digital assets in 'Black Body Radiation: Rescripting Data Bodies.'

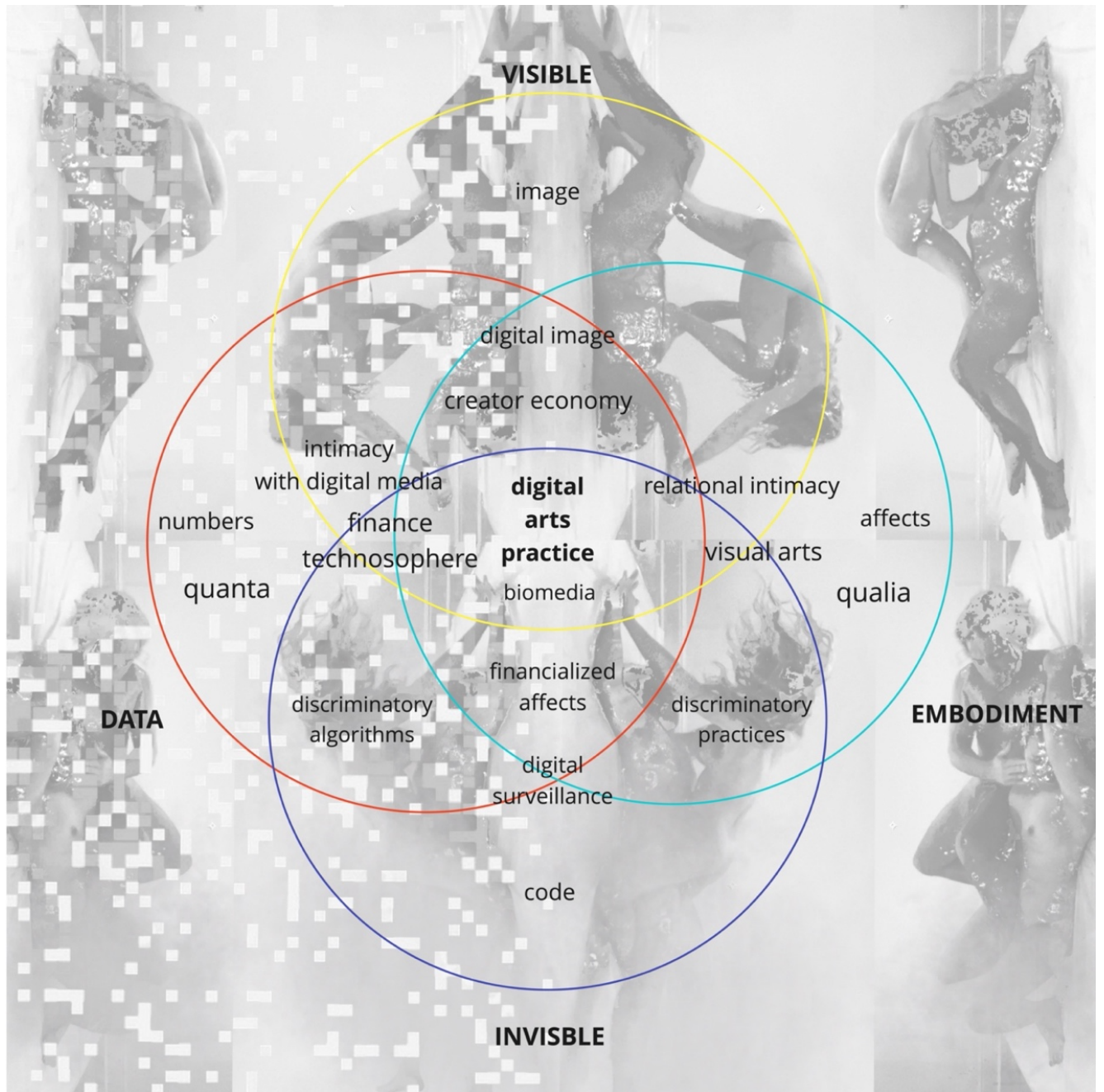


Fig 20: Diagram of locations and negotiations around my practice

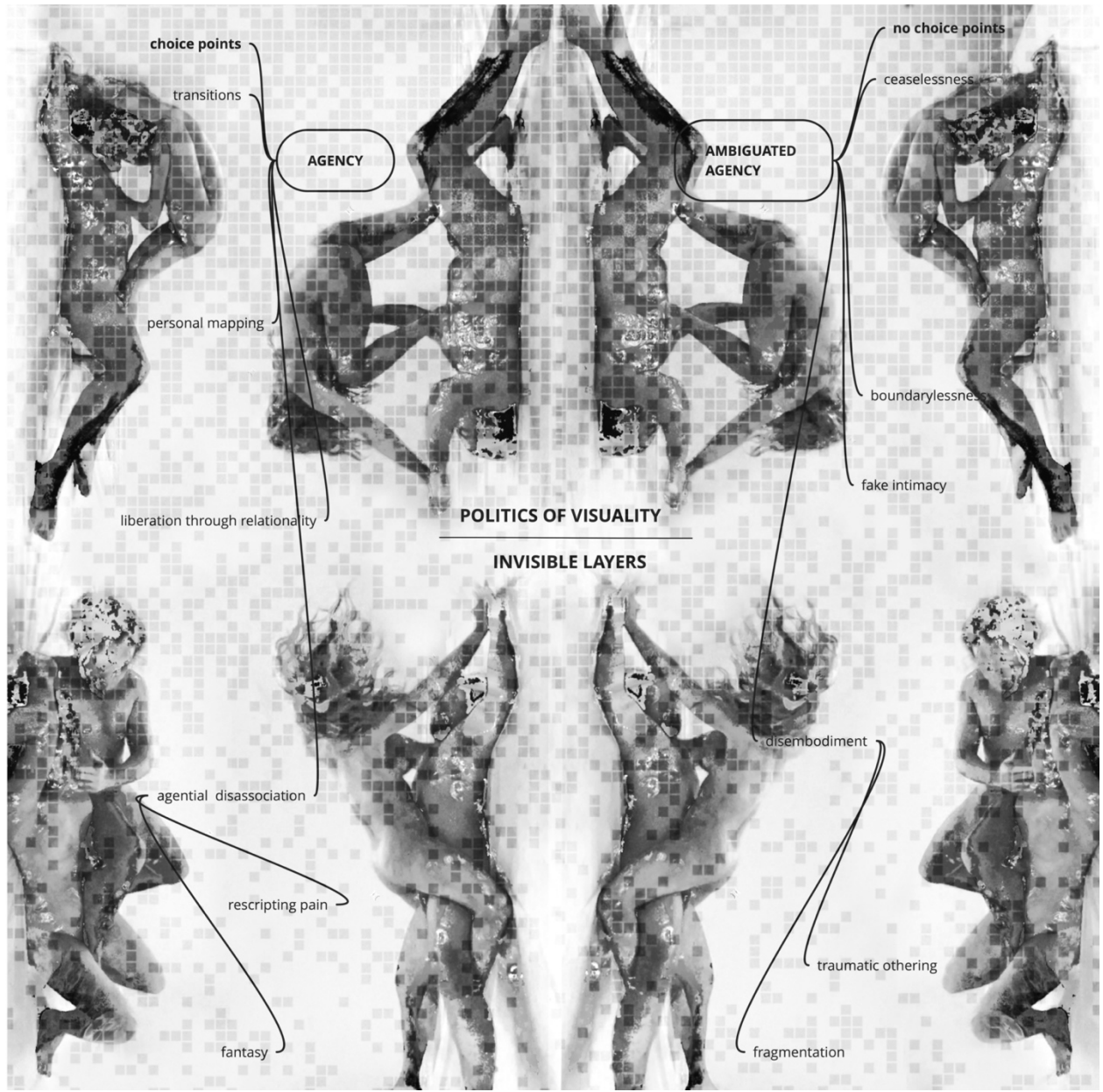


Fig. 21: Diagram exploring architectures of agency vs. ambiguated agency

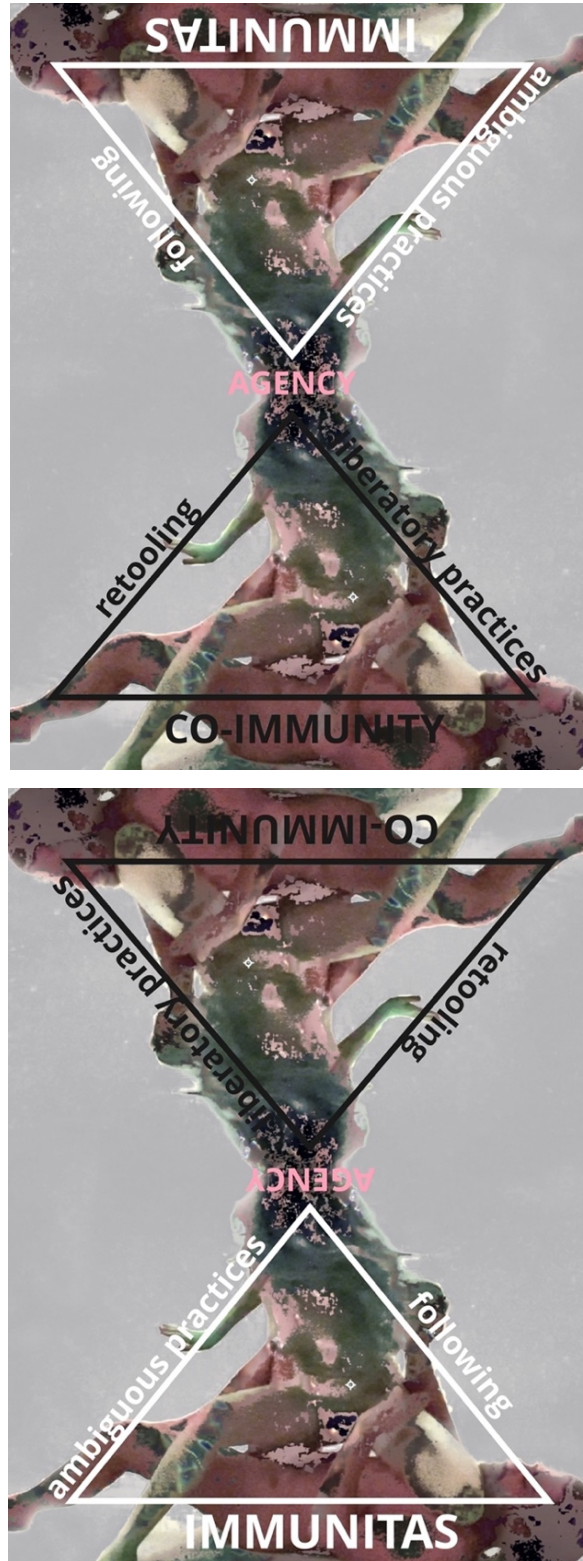


Fig. 22: Inverted diagrams exploring opposing choice architectures

Paradigms of co-immunity & post-traumatic growth

My work and research in this chapter, including my interview with Grace Quantock, helped me map relationships between digital media, the post-biological or 'biomediated body'¹⁴³, and traumatic thresholds. As a form of personal and conceptual mapping, this gave me agency to understand techno-social locations and negotiations around my practice and to prepare for future artworks. Through this mapping, I was able to renegotiate my experience with digital media as both a user and as an artist. This corresponds to a period of post-traumatic growth in myself and personal life.

In this section I briefly touch upon my understandings of the 'biomediated body' as articulated by Patricia Ticineto Clough as well as immunological systems as paradigms for growth. This short overview on immunological paradigms is not meant to counter or move beyond the traumatic, but to offer an alternative model of relationality, both human and other-than-human, that could support post-traumatic growth, co-immunity, and a recalibration of trust in digital systems. I also include these to counter an account of negotiations between self and other in digital media systems that is based only on an in-depth consideration of traumatic responses.

In posthuman and postbiological assemblages, the receptiveness of diverse materials to designability and programmability has opened new lines of communication between the biological, technological, informational, and financial resulting in new emergent fields such as bioinformatics, genetic engineering, and biocomputing. Terming these new fields 'biomedia,' Eugene Thacker stresses the "body-technology relation" as one in which "the biological body never stops being biological."¹⁴⁴ Surgically implanted devices and biomaterials ('bio-hacking') have realised new material assemblages between bodily matter, flesh, silicon, titanium, and electricity.

For Thacker, these post-biological assemblages do not inherently disturb the biological body's capacity of 'being biological'. An example of this body-technological threshold are the replicants from the film 'Blade Runner', as they illustrate the propensity of the human body to stay biological even under extreme forms of genetic engineering and not being 'human born'. The replicants' psychological propensity to 'never stop being

biological' manifests as other-than-fully-human feelings, a liberatory capacity for love and freedom within a post-biological threshold. The twist is that the replicants' liberatory and embodied self-discovery exceeds the decrepit and questionable humanity of the human born.

Another way of approaching this intimate intersection of data and bodies is through Patricia Ticineto Clough's concept of the 'biomediated body'. For Clough the capacity for bodily matter to be informationalised relates to the inherent capability of matter to affect and be affected. For Clough, the 'biomediated body' "is a historically specific mode of organisation of material forces, invested by capital into being" that "points to the political economic and theoretical investment in the self-organisation inherent to matter or matter's capacity to be in-formational."¹⁴⁵ My research thus far explores the intersections that bring to bear the 'biomediated body' while approaching posthuman and post-biological thresholds through the lens of the vulnerability of bodies and susceptibility to traumatic states.

To 'affect and be affected' builds on the Spinozean turn away from the metaphysics of spirit and the notion of the individual grounded in the idea of a juridical subject or body-as-organism. Affects can exist in a pre-individual mode of being, beneath conscious thought. For Spinoza affect is distinguished from an idea, as an idea is a mode of representational thought, whereas an affect is a non-representational embodied concept. The "biomediated body" is one whose affectual resonances have been tapped by digital media, which both records and expands 'what a body can do'. Informational technologies, according to Clough, expand the informational substrate of bodily matter and, taking the term from Keith Ansell Pearson, introduce the "postbiological threshold" into life itself¹⁴⁶.

For Clough, the 'biomediated body' is one whose boundary conditions have been expanded by digital media while remaining biological, a direct challenge to the autopoietic model which sees the body-as-organism, a closed and self-regulating entity. Building on the work of Brian Massumi and David Bohm, Clough argues that the informationalisation of affect points towards the openness of matter and bodily states because of the "quantum indeterminacy of matter."¹⁴⁷ This indeterminacy connects matter

to potential and virtual fields, allowing matter to pass through ‘techno-ontological’ thresholds including organic and inorganic life. Drawing on Deleuze’s notion of machinic production, Clough goes on to argue that Quantum indeterminacy brings matter into highly heterogeneous assemblages that can combine human and nonhuman, or, organic and inorganic agencies.

Emergent material intersections between the biological and technological animate new thinking around subjectivity, affectivity, and embodiment, drawing on Spinozist formulations of ‘what the body can do.’ While traumatic responses emphasise the need for self-differentiation to clearly separate self and other or self and environment, I want to briefly consider immunological responses as a supplement to this discussion. Immunological paradigms offer alternative paradigms of togetherness, nesting, community, and shared intimate ecologies. These negotiations of self and other in digital media systems and the possibility of rescripting these in non-traumatic ways are part of what constitutes the second movement of my practice.

In ‘Anti-Marta,’ artist Marta De Menezes and her partner, an immunologist, exchange mutual skin grafts by cutting out and resowing small patches of skin from each other’s forearms.¹⁴⁸ As ingress and egress points, these four cut passages mark organismic boundaries between self and other, as the transplanted skin tissue will inevitably be rejected by the recipient. What interests the artist is not quite the wound-like interface or botched appearance of the procedure, but the immunological labour of the body producing a negative mirror image of self and other, the ‘Anti-Marta’ and the ‘Anti-Luis.’ This anti-couple composed of antigens on the boundaries of self and other, enters the semiotic field as a pact between lovers: an inverted image of matrimony as a botched procedure which cannot overcome the limits of self and other except as ritual.

Immunological systems, are far from operating as simple dialectical machines regulating relations between self and other. Instead, immunity expresses complex and mutable relations of self-differentiation and otherness that turn around ontological precepts of how a self or organism is made. While immunological systems can describe interpolated and transgressed boundary conditions towards the preservation of life, as

political analogies immunological paradigms have been used to justify state actions or military incursions on behalf of communities and the health of the body politic, including pathologising foreignness and introducing military lexicons into medical speech.

In his work *Immunitas*, Roberto Esposito, plays on the lexical and genealogical roots of 'immunity' and 'community', to show how the immunological paradigm has been applied across law, medicine, politics, and computation, to justify internal mechanisms of countering an external threat. Immunity, he explains, "is the internal limit which cuts across community, folding it back on itself in a form that is both constitutive and deprivative: immunity constitutes community precisely by negating it."¹⁴⁹ As a political dispositif, immunological paradigms have largely been used to justify state exception or the intensification of sovereign boundaries for the common good.

Materialist feminist interpretations have successfully challenged binary and militarised representations of immunological processes by emphasising maternal-foetal cross-immunities and other forms of symbiotic co-immunity. Embryonic pregnancy, for example, requires the suppression of the mother's immune system against paternal antigens expressed by the foetus, to create a positive immunological environment for both mother and child. Maternal dendritic cells work to code, recode, and decode materialities as states of danger/neutrality, self/other, in order to regulate what is proper to the mother's internal environment, exceeding the domains of interiority and externality. The immunological responses involved in mother-foetus relationships, unlike the antigenic anti-couple or the body at war, offers an entirely different view of the immunological system: one in which biochemical materialities exist in dynamic relations mediated by material-informatic modes of communication between what is biochemically coded 'self' and 'other'.

In her work on postmodern bodies and immunity, Donna Haraway emphasises bodies as 'material-semiotic' knowledge constructions that crisscross the lines between nature, culture, technology, and capital. "Just as computer design is a map of and for ways of living," Haraway writes, so "the immune system is in some sense a diagram of relationships and a guide for action in the face of questions about the boundaries of self and about mortality."¹⁵⁰

CHAPTER 3: DIGITAL AFTERCARES

Chapter overview

Over the course of this study, my digital retooling methodologies evolved to push my practice beyond the interfacial and representational towards agential, interventional, and process-oriented art projects. My stress on backend redesign and digital infrastructure has allowed me to develop creative tools and skills to rethink the way my artwork moves in the world over time. My practice is supported by my research on the social dimensions of technology, critical race studies, decolonial data studies, and design justice.

In this chapter I present two works that further deepen my understanding of the social dimensions of technology and the possibility of retooling digital processes towards greater visibility of oppressed groups and to incentivise positive climate action. In ‘Virtual Keffiyeh’ I consider the advent of the virtual in relation to the occupation in Palestine/Israel and design a political intervention in emerging virtual and metaverse spaces. This draws on my experience as a Palestinian-American and my interest in Palestinian digital rights. In the final work I submit in this thesis, Or:bita! Bloom, I present my work as a creative technologist using the strategies and methods I develop through digital retooling, to rethink the way that sustainability data can be repurposed into data-driven storytelling. This work further extends my role as an artist to becoming a co-founder of a startup that creates sustainability-driven digital artworks.

This chapter ends with reflections on the changing role of the artist across my work, my desire to differentiate my practice from the image and attention economy, the changing role of the artist in my practice, and my concluding thoughts on digital aftercares as emerging modes of care in digital and technical systems.

“VIRTUAL KEFFIYEH”

A digital wearable / an article / a talk / a network of care

‘Virtual Keffiyeh’ combines research, article writing, the design of a digital wearable, and advocacy to draw attention to Palestinian digital rights in the advent of virtual and immersive technologies.

The digital wearable is based on the traditional Keffiyeh and is designed for use in Decentraland, one of the most popular metaverse platforms on the web today. The wearable is intended to show solidarity with the Palestinian cause in digital spaces. I designed ‘Virtual Keffiyeh’ in conjunction with my article on virtual apartheid for +972 Magazine, which is available at <https://www.972mag.com/occupation-metaverse-palestine/>

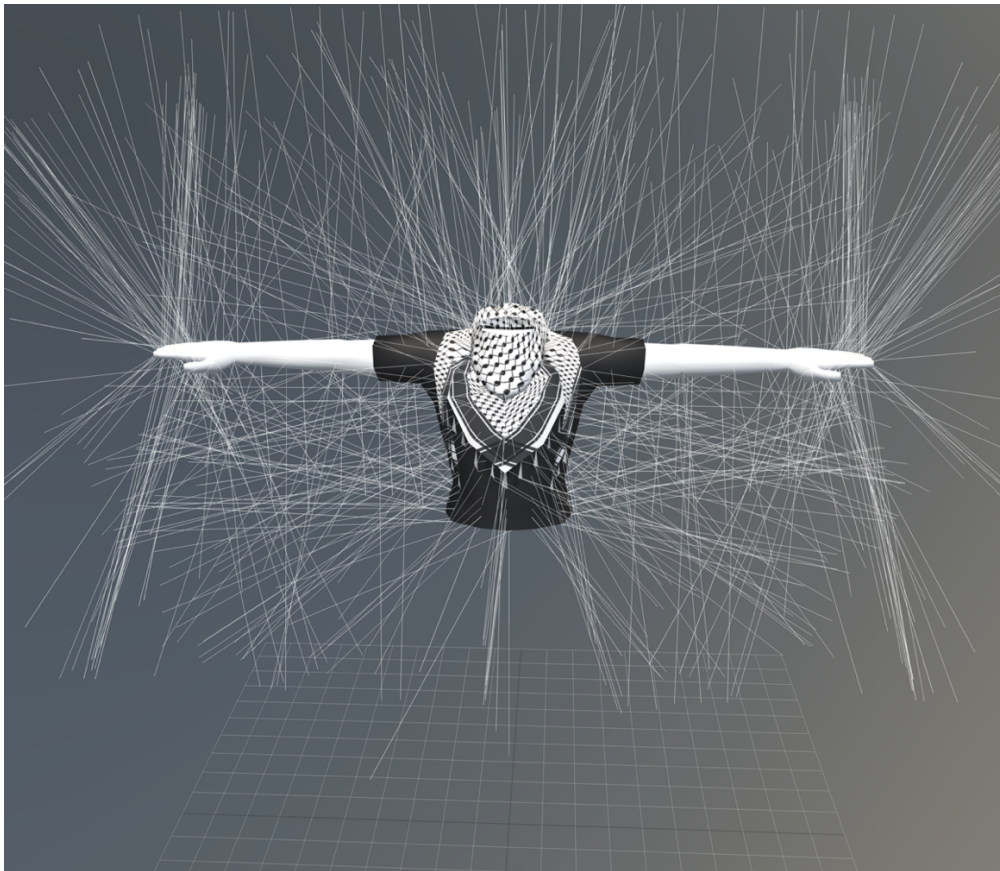


Fig. 23: A digital mock-up of keffiyeh wearable in 3-D mesh

Virtual threads

The black and white checked Keffiyeh (or Kufiya) is a cotton scarf that is a symbol of Palestinian resistance and solidarity. According to Hirbawi, the only remaining manufacturer of authentic Keffiyehs in Palestine, the material has to be woven in two layers—the “base” and “the pattern” or “flower.” Though the Keffiyeh is made on machinic looms, the threads have to be cut manually.¹⁵¹

For ‘Virtual Keffiyeh’, my aim is to ‘cut’ the Keffiyeh out of digital meshes for emerging metaverse spaces. The purpose of the digital wearable is to draw attention to the digital occupation and divide in Palestine/Israel and its deleterious consequences. In addition to the wearable, ‘Virtual Keffiyeh’ is an ongoing project that incorporates research, writing, community-building, and advocacy of Palestinian digital rights in view of the occupation in Palestine.

I decided to translate the traditional fabric of the Keffiyeh after looking at digital wearables for my avatar in a few metaverse marketplaces and realising there weren’t any Keffiyehs available. It also occurred to me that given the occupation of Palestine and its devastating impact on Palestinian digital development and rights, I was unlikely to encounter many Palestinians from the West Bank or Gaza on the metaverse because of digital access issues that result from what Helga Tawil Sourì calls ‘the digital occupation.’¹⁵²

For this work I draw from my experience as a Palestinian-American and as an activist compelled by issues related to digital rights, in stage an intervention in the future-oriented narratives of virtual and immersive technologies. I draw from my digital retooling methodologies to guide the project, which involves research, publishing an article, creating a community of care, and designing a wearable to retool existing metaverse technologies to draw attention to possible sites of erasure of Palestinian narratives.

What is the metaverse?

The metaverse refers to a vision of the internet that more closely resembles an environment through virtual reality, augmented reality, gaming, and 3-D modelling

technologies. In the most general sense, “the” metaverse as a single entity describes the potential of multiple immersive digital worlds to become interconnected, as each ‘metaverse’ platform is created by different tech companies and might have different features or aesthetics.

While there is no consensus as to what exactly the metaverse is or will become, the term is used to describe immersive digital experiences powered by virtual reality, augmented reality, and gaming engines, and sometimes blockchain-backed technologies and cryptocurrencies. Another definition of the metaverse is that it describes a threshold when our digital lives become the primary way we socialise or earn a living. The metaverse can refer to the tipping point when online reality is as important as what happens offline.

Metaverse technologies create the illusion of a digital world where users have individual avatars, buy digital property, wearables, or virtually shop, hold meetings, visit art galleries and so on. These immersive digital worlds are graphics and computing intensive, and require high speed internet, powerful graphics cards and computing power.

Emerging politics of metaverse spaces

In the spring of 2022, there was much clamour and hype around emerging metaverse worlds. The notion that the metaverse represents the future of online computing shows how tech corporations lay stake to the future by claiming narrative space and cultural bandwidth today. Tech giants like Microsoft and Meta (formerly Facebook) are moving into metaverse spaces to monopolise representations of the future today and thus take part in what Gerald Nestler calls the “speculative thrust of the derivative.”¹⁵³ However, there is little discussion about how innovation that only targets privileged users deepens the digital divide.

In the case of Palestine, the growing digital divide between Israeli and Palestinian communities has devastating social, economic, and political consequences. My intention in ‘Virtual Keffiyeh’ is to challenge corporate, nationalist, colonial, and militarist

representations of the future and to hack into the ‘speculative thrust’ of controlling master narratives.

Palestinians in the West Bank currently only have access to 3G internet (3Mbps) while Gaza remains limited to 2G (0.1 Mbps). The metaverse, as an interactive 3-D experience is data-intensive and requires extremely high download speeds. Existing and popular metaverse platforms that run on web browsers, such as Decentraland, require at least 10 Mbps to run. This presents a significant digital barrier to communities without access to highspeed internet and powerful computing technologies.

Article and funding

I pitched an article to +972 Magazine, an online independent news outlet run by Israeli and Palestinian journalists, on the advent of virtual spaces given the digital apartheid in Palestine and Israel. They loved the idea, and I was commissioned to write the piece.

My article lays out the systematic digital de-development, lack of fair digital access, and surveillance issues that comprise the communication sector for Palestinian communities in the West Bank and Gaza. My concern in writing the piece is to draw attention to a possible virtual layer of the occupation, within the hierarchy of practices that Eyal Weizman has called ‘politics of verticality’ or ‘vertical apartheid’¹⁵⁴. As Palestinians remain restricted to 2G and 3G access, and Israeli citizens move towards 5G, my article sounds the alarm as to what might occur in virtual spaces when a digital divide of this magnitude becomes entrenched.

My article, digital wearable, and talk contribute to an ecology of practices around ‘Virtual Keffiyeh’ that create awareness and networks of care at the intersection of digital arts and activism. Furthermore, my digital wearable tests the emerging politics of metaverse spaces.

My plan is to use the money from the +972 commission to fund a portion of the costs of designing and publishing of the digital wearable. The cost of designing and publishing the digital wearable on Decentraland is approximately \$1000. I plan to make the digital wearable available to the public either for free or for a nominal amount that

would then be donated towards Palestinian digital rights, for example, through 7amleh, or The Arab Center for the Advancement of Social Media,



Fig. 24: An in-game preview of a black and white keffiyeh wearable in ‘Decentraland’

Excerpt from +972 Magazine

My article came out on February 22, 2022— it was widely shared, and I was grateful to receive positive feedback.

The following is an excerpt from my article ‘The occupation enters the Metaverse’:

Following the Oslo accords, Palestinians obtained the legal right to build their own communications infrastructure. In practice, however, Israel has severely restricted Palestinian development of infrastructure, cell phone towers, fiber optic cables, and access to cellular frequencies.

In the West Bank, access to communications infrastructure is fragmented across areas of Areas A, B, and C. For example, the Palestinian national cellular provider, Jawwal, is only permitted to have a strong cellular signal in Area A. Palestinian communication infrastructure remains forbidden in Area C, while unauthorised Israeli

providers bring 4G coverage to Israeli settlements in those same areas. As a result, to have adequate coverage across the West Bank could mean carrying three separate SIM cards — from Palestinian, Israeli, and Jordanian providers.

In her article on “smart colonialism and digital divestment,” Anna Kensicki has written about how “selective deployment” of internet and communication infrastructures allows “plentiful 4G coverage to penetrate deep into the rural parts of the occupied territories for settler use, regardless of need or legality, while at the same time, coverage for Palestinians — who have only 2G or 3G connections — is not responsive to need or population density.”¹⁵⁵ In Kensicki’s analysis, for “Jewish Israeli society, hyperconnectivity enhances Israeli nationalism and digital citizenship,” while for Palestinians, “low levels of connectivity have further fragmented the Palestinian national movement.”¹⁵⁶

Virtual apartheid?

As Israel retains tight control of Palestinian frequencies, airwaves, and subsoil, which architect Eyal Weizman terms “vertical apartheid,”¹⁵⁷ is it inconceivable there could eventually be a virtual layer too? For example, in one emerging Metaverse platform, called Super World, a digital map of the earth is divided into 64 billion plots of virtual land. By buying this “digital real estate” users can create augmented reality overlays over the physical world.¹⁵⁸

To date, at least 50 or so of these digital plots have been bought in the Old City of Jerusalem. This allows users with access to the app and VR headsets to see completely different overlays of the city than those without. In an area as divided as Jerusalem, a virtual layer of user-generated information and graphics could further aggravate existing tensions and entrench one-sided narratives. It is also possible that politically motivated virtual and augmented reality vandalism and graffiti could become commonplace.

A virtual layer that is only accessible to high-tech users, while remaining invisible to those without adequate technological capabilities, would undoubtedly contribute to the asymmetries of the digital occupation and the constant state of surveillance to which Palestinian communities are subjected. For example, Blue Wolf, an Israeli surveillance

database described by one soldier as “Facebook for Palestinians”¹⁵⁹ incentivises Israeli soldiers to take photos of Palestinians without their consent or knowledge. This allows the Israeli military to weaponise smartphone technology as a widely disseminated instrument of surveillance.

A virtual layer would further deepen this interplay of repressive politics and asymmetrical technological capacities. Biometric or sensitive security information could be projected virtually, accessible to privileged or select users while remaining invisible to marginalised and subjugated populations.

In the race to control virtual space, the Metaverse is ushering in a new era of “digital real estate,” replete with “digital land grabs” and “real estate booms.” By owning digital territory, digital landowners can control what they “build” in the Metaverse and by extension, how the digital experience is curated. For example, in popular Metaverse worlds like Sandbox or Decentraland, users purchase digital plots as NFTs on which they might “build” online galleries, gaming stops, or online shops.

In the most popular Metaverse platforms existing today, digital property can command up to six or seven figure amounts. As digital landowners can influence and curate user experiences, any future Metaverse platform following this model will be influenced by emerging digital geopolitics of representation as well as asymmetries between “users” and “owners.”

Should Palestinian communities—already restricted by digital occupation in the form of physical mobility, bandwidth, and economic constraints—be worried about representation and technological disparities in virtual spaces to come? Furthermore, were the Metaverse to take off, would issues of access and inclusion/exclusion determine who can participate in emerging virtual and digital economies of the future?

Talk at the Palestine Digital Activism Forum

The graphic is a promotional poster for a talk. At the top left, it says 'Talk at the Palestine Digital Activism Forum'. Below this, there are two circular portraits. The first is of Ameera Kawash, with her name and title 'Artist, Writer, PhD Student' below it. The second is of Amjad Iraqi, with his name and title '+972 Magazine' below it, and a 'Moderator' speech bubble above his portrait. To the right of the portraits is the PDAF logo, which includes the text 'متندى فلسطين للنشاط الرقمي' and 'Palestine Digital Activism Forum'. Below the portraits is a large blue banner with the text 'Occupation and Metaverse' in white, flanked by red and green double arrows. Below the banner is a dark blue bar with the date and time '18.5.2022 | 14:15-14:30' in white. At the bottom right is the 7amleh logo, which includes the text 'جميلة - المركز العربي لتطوير الإعلام الاجتماعي' and '7amleh - The Arab Center for the Advancement of Social Media'.

Fig. 25: Talk at Palestine Digital Activism Forum

After my article was published in +972, I was contacted by 7amleh, The Arab Center for the Advancement of Social Media, to be a speaker at the 2022 Palestine Digital Activism Forum. The forum took place over four days online.¹⁶⁰ Featured speakers included congresswoman Rashida Tlaib, and representatives from the UN Special Rapporteur, Twitter, Whatsapp, and the Palestinian Minister of Telecommunication. On May 18th I gave a talk about my article and discussed 'Virtual Keffiyeh', which was attended by a few hundred people. I was interviewed by Amjad Iraqi, an editor and writer at +972 magazine.

I am currently in talks with others who want to strategize around interactions between emerging metaverse and virtual spaces in relation to the digital divide and occupation in Palestine/Israel. I am also in discussions with +972 magazine on a second instalment of the article, which will explore more recent Israeli military developments around AR/VR and their social/political consequences.

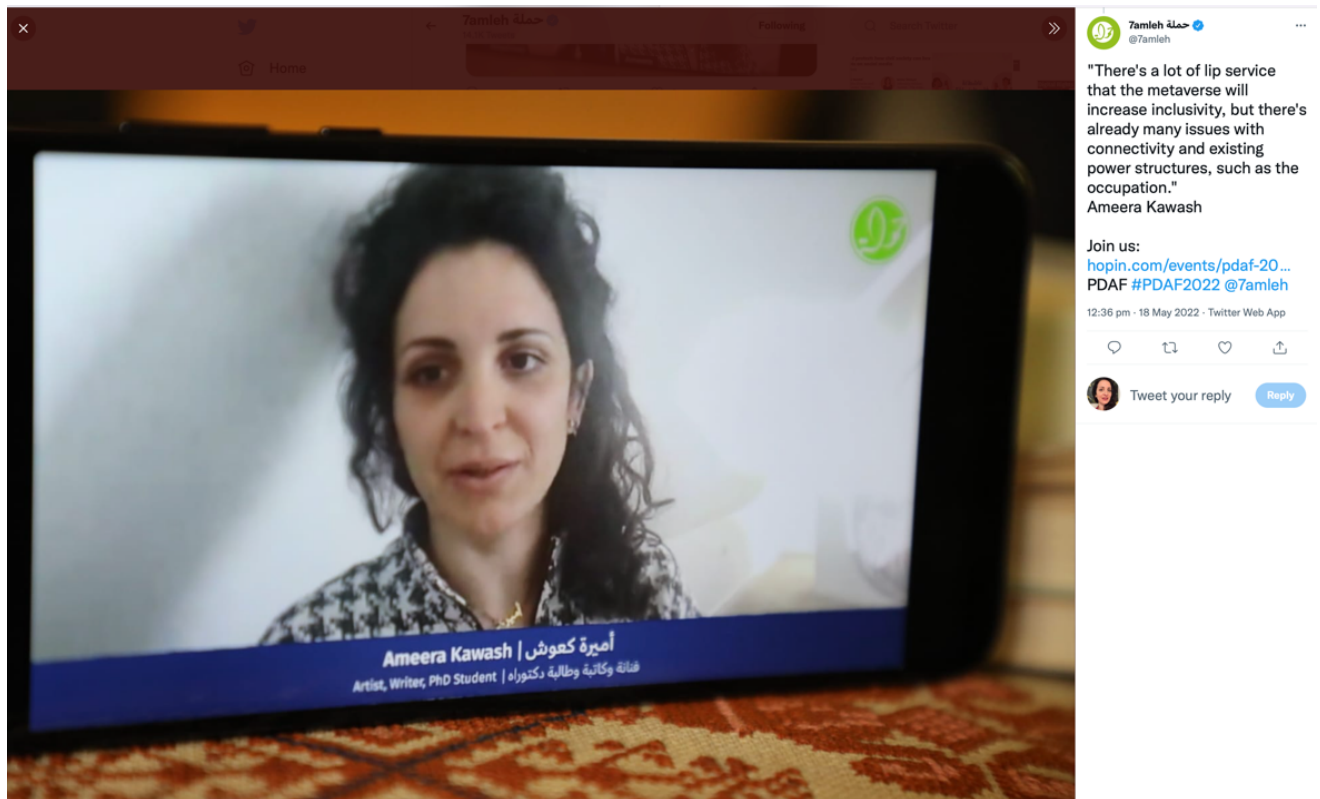


Fig. 26: 'Occupation and Metaverse' talk for the Palestine Digital Activism Forum

'Virtual keffiyeh' wearable

'Virtual Keffiyeh' is a digital wearable which will be made available to digital users of Decentraland, a metaverse platform. The purpose of the wearable is to draw attention to Palestinian digital rights, the exclusion of those on the other side of the digital divide, and the possibility of political censorship in emerging metaverse spaces.

Working with a studio specialising in digital fashion design, I designed and created two wearables for Decentraland: a black keffiyeh and a pink keffiyeh. These fit both male and female avatars. The black keffiyeh is modelled after the traditional Palestinian keffiyeh while the pink is a contemporary interpretation.

Digital wearables have to go through a curatorial committee on Decentraland before being minted. As there is a possibility that the black and white keffiyeh could be

censored, I created the pink keffiyeh to have a comparable and therefore test whether the traditional version would be censored for political reasons.



Fig. 27: Pink keffiyeh on avatar

I submitted the keffiyeh to the Decentraland curatorial committee in January of 2022. As curatorial decisions can take a few weeks, I waited until March until I received an answer from Decentraland. The committee wrote back that the design has clipping and rendering issues that prevent it from being approved. I took these back to the designer who purportedly fixed the issues and sent me back the files. However, I resubmitted these in April and they again failed to pass the curatorial committee.

I contacted the designer again who now claims not be able to fix the problems, pushing the blame on the curatorial committee for being difficult. Since my conversation

with the designer in April, who I do not know personally and is based in Milan, I have not received any response on how to fix the issue or other recourses that can be taken.

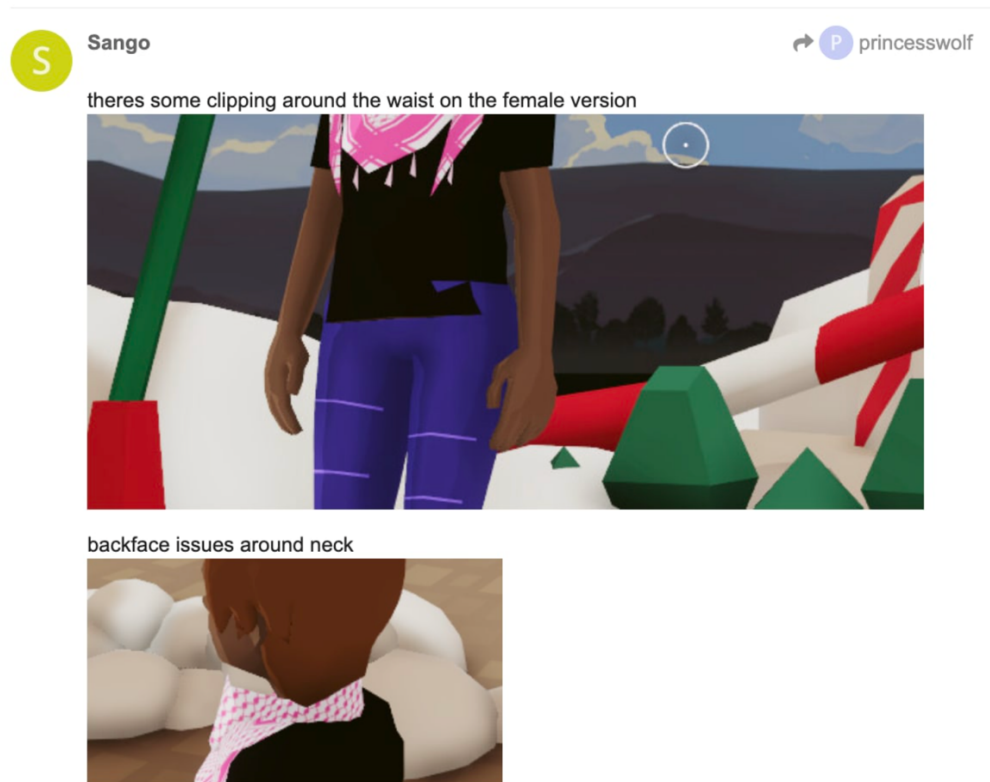


Fig. 28: Clipping issues— feedback from Decentraland Curatorial Committee

Independent verification of design obstruction

Since I have no experience with the 3-D modelling software used to design digital wearables, I myself cannot verify whether the keffiyeh is being obstructed due to design issues or because it is being censored for political reasons by the Decentraland curatorial committee. I felt at a loss and had lost personal funds in the project as the designer had taken my money in full without taking responsibility when design errors emerged through the curatorial process.

Luckily, after I joined InnovationRCA in June, I met a colleague who is a digital fashion designer. She kindly looked at the files and verified that there are several design issues preventing the wearable from being published.

As the previous designer is no longer responding to my messages, my colleague has offered to help me find a more trustworthy digital designer. To date, this would still be the only virtual keffiyeh for metaverse spaces that I have encountered.

I am disappointed to have wasted time and funds on an untrustworthy designer without scruples. It has been frustrating to operate in an emerging space where there are still little resources for help online, and to meet trustworthy people with whom to collaborate with. Once I find a trustworthy designer through my networks at the InnovationRCA and am able to raise some funds for the project or recoup my losses from the previous designer, I will go ahead with designing and publishing the digital wearable from scratch. This process is likely to take several weeks or perhaps months, however, it is important to me and for this project so I will do my best to try to accomplish this with the resources I have.

VIRTUAL KEFFIYEH: TESTING OF DIGITAL RETOOLING

‘Virtual Keffiyeh’ uses my digital retooling methodologies to contest dominant narratives in emerging virtual and metaverse spaces, by creating a network of care and advocacy around the project, and recontextualising digital wearables towards decolonial and liberatory goals.

‘Virtual Keffiyeh’ develops digital retooling through an in-depth consideration of discriminatory tech and the digital divide in the context of Palestine/Israel which is most fully expounded on in my article for +972. The project retools digital wearables as a means of showing solidarity for Palestinian rights in virtual and metaverse worlds; these wearables also test political expression and identity representation in metaverse spaces. As an ongoing research project, ‘Virtual Keffiyeh’ generates new knowledge on the subject of Palestinian digital rights in the advent of virtual worlds, as my article is the first to sound the alarm as to the erasure of Palestinian communities and voices in virtual and metaverse spaces. My digital wearable, as of writing, is the first Keffiyeh designed for Metaverse spaces (though its publication is still pending). My hope is that the project will continue to grow in ambition and scope, developing additional strategies and artworks as it moves in the world.

As artistic practice, ‘Virtual Keffiyeh’ advances my digital retooling methodologies to take on default settings that result from the digital occupation and to develop artistic strategies for resisting digital exclusion and apartheid. My wearable is an artistic intervention meant to interject Palestinian voices and visibility in exclusionary high-tech spaces such as the metaverse. The project designs a virtual keffiyeh as a creative, decolonial, and artistic intervention that advances digital retooling’s aims of rescripting defaults, changing the politics of visibility, and evolving modes of care in unjust and discriminatory systems.

The following sections discuss the application and development of digital retooling as a decolonial practice, a network and mode of care, and as scheme for hacking future-oriented narratives. Going back to my previous chapter, I also consider the ‘nested intimacies’ brought to bear by the metaverse and immersive technologies, for instance, the

strangely intimate nestings between bodies, avatars, digital twins, and technologically produced environments.

My intention is to apply my digital retooling methodologies towards the strengthening of Palestinian narratives in digital spaces and to warn of new types of digital erasure. My work for this project is informed by my readings on design justice, discriminatory tech, and questioning the neutrality of digital media— which I discuss at length in my first chapter.

Digital divide

In my section on retooling as decolonial practice, I discuss the imbrication of digital technological systems with colonial, capitalist, and racialised regimes, drawing from the work of Ruha Benjamin, Jonathan Beller, and Sasha Costanza-Chock. As I write, the aim of postcolonial computing is to examine how communications technologies become entwined with existing power dynamics and injustices, towards specific outcomes. Decolonising approaches challenge neutral or universalist technological master narratives, to emphasise local effects and aftermaths on marginalised and oppressed groups.

In 'Virtual Keffiyeh,' I consider the impact of virtual and immersive technologies on Palestinian communities living under Israeli colonial rule with low access to highspeed internet and computing power, a product of what Helga-Tawil Sourì calls the 'digital occupation.'¹⁶¹ In Israel and Palestine, the digital divide exists in extremity and manifests across multiple local realities.

In the context of Palestine/Israel, the digital divide is produced by the occupation and deliberate de-development of Palestinian communications infrastructure. In my article for +972 I discuss the impacts of Israeli control of cellular frequencies and bandwidths, the limiting of hardware and software, and other forms of control which incurs huge losses economically, politically, and socially for Palestinian communities. The emergence of 5G, computing-intensive programs, virtual and metaverse spaces for those with privileged

access will further intensify the chasmic digital divide between Palestine/ Israel and consolidate current power imbalances and injustices.

The advent of virtual and immersive technologies will interact and overlay the politics of visibility already at work in the occupation. In 'Visual Occupations,' Gil Z. Hochberg discusses the "partitioned vision" which caters to the "Israeli dominant field of vision" and "superimposes a fantasy of radical separation between Israelis and Palestinians"¹⁶²; the separation wall being the most obvious meridian of this visual regime. Adding a virtual layer to this already existing "partitioned vision" will only concretise, spatialise, and further entrench the politics of visibility already at work in the occupation. Users of AR/VR technologies would literally see different overlays or else not see at all depending on whether they have access to devices or not.

Digital divides are not stressed in universalist or plug-and-play approaches to technology, with most innovation targeting privileged digital users. Emerging virtual and digital worlds are predicated on ever faster and more powerful computing technologies, with little attention going to users with limited digital access or slower download and upload speeds. As internet users with advantaged digital access increase their personal computing capacities and embrace 5G technologies, new and slick dreamscapes unfurl for those with the graphics cards to see them. However, these worlds and products exclude huge swathes of the global population without access to high-speed internet or computing power.

The metaverse or future of AR/VR realities might seem like a far-off reality made up of expensive toys for the privileged few. However, activists concerned with the digital divide and digital rights should be considering the disadvantages of not being able to participate in high-tech systems against the value of abolitionist approaches.

A digital network of care

'Virtual Keffiyeh' applies my digital retooling technologies to developing new modes of care in emergent digital spaces. By drawing attention to the 'digital occupation'¹⁶³ of Palestinian communities and the extension of 'partitioned vision'¹⁶⁴ into

the digital and virtual, I hope to draw attention to the politics of visibility in technologically produced spaces.

My intervention's aim is to develop visibility and community around a site of potential erasure in virtual and metaverse spaces. 'Virtual Keffiyeh' works across several platforms to raise awareness and build community. The digital wearable would allow users to express community and show support for Palestinian digital rights in metaverse spaces. The article and talk helped grow care and community around Palestinian digital rights. As this network grows and develops, interventions can become more impactful.

Going forward, I hope Palestinian communities and allies can strategize ways to counter future sites of digital erasure and one-sided narratives. Thus 'Virtual Keffiyeh' aims to disrupt the politics of visibility in emerging metaverse platforms that deepen existing digital divides and render oppressed and disadvantaged communities, such as users in the West Bank and Gaza, invisible.

Blurring of boundaries

The arrival of the metaverse and virtual technologies are significant because they present new modes of spatialised information and digital embodiment. Immersive and responsive elements blur the boundaries between the virtual and the real, self and environment. In my previous chapter I refer to these strange entanglements as nested intimacies. In my interview with Grace Quantock, she pulls at the thread of undoings in relation to the body and its digital environment.

"So that's my first question, where do we locate the metaverse: internally or externally? And how is it held internally or externally? Is it contained? Is it kind of sprawling? Where are the edges? Can you fall off? Can you fall out? Can you fall in again? What happens with that? And then also how does the body responds to metaverse VR when you're there?"¹⁶⁵

The metaverse and VR/AR spaces bring new nested intimacies and ontological unravellings as technologically produced reality becomes ever more present and seamless. The immersive, responsive, and sensory nature of how bodies interact with digital

environments can further entrench and naturalise the digital divide. The metaverse threatens to deepen power imbalances and default inequalities already at play in the current internet, digital capitalism, and global communications infrastructure.

In the context of the occupation of Palestine, AR/VR can further extend the politics of visibility into a spatialised environment, deepening the injustices produced by the digital occupation and de-development of Palestinian communications infrastructures. Virtual and metaverse spaces run the risk of further extending, concretising, and normalising the digital divide and the erasure of Palestinian communities from technologically produced or enhanced spaces.

Digital landowners

The metaverse as a default program is a political space in which digital media is designed to function like private property in the offline world. That digital worlds are made to resemble property in the real world is an ideological position that conditions digital value through the imposition of a system of digital scarcity and enclosure. To understand this, consider that digital assets are very cheap to reproduce, and that digital space does not have to obey physics or Euclidean geometry at all.¹⁶⁶ The idea that digital space is defined by singular locations runs contrary to digital media's capacity to copy itself or exist in several instances at the same time. These politics and ideological positions come fully loaded into the metaverse's default settings.

What does it mean if existing power dynamics become represented in new classes of digital landowners or the digitally landless? Will digital spaces be divided by those who have the power to curate experiences, those who can access these spaces as visitors, and those without the digital access to engage with these spaces at all? Will the metaverse be for everyone, as tech giants claim, or for the privileged few who have the computing power and bandwidth to dominate increasingly technologised worlds?

Palestinian avatars

Digital technology has always made use of future-oriented narratives to sell gadgets in the present. Furthermore, big tech evokes the forward momentum of the future to continue to evade responsibilities today. By laying stake to the future—even if it means proposing speculative products that look like vaporware to users without privileged digital access—tech giants build on the reckless politics of Zuckerberg’s often repeated former motto ‘move fast and break things.’

As the metaverse continues to evolve as a narrative of the future in the present, my research and work for ‘Virtual Keffiyeh’ asks who this narrative is geared towards, and who is excluded. How will current injustices be spatialised and concretised in emerging digital landscapes and what kind of interventions need to happen now to counter the erasure of Palestinian narratives from emergent digital spaces?

My intervention with ‘Virtual Keffiyeh’ is simple and straightforward: to create a digital wearable to draw attention to the absence of Palestinian narratives in emerging virtual or AR/VR worlds and to build community and discussion around this space through articles and talks. The digital wearable targets representational politics in alternatively embodied or re-embodied immersive digital worlds, bringing awareness to the erasure of Palestinian narratives and voices from these spaces as a consequence of digital apartheid. As an intervention in the creation of future narratives by big tech and the digital state, the digital wearables are designed for Palestinian avatars and to show solidarity with Palestinian digital rights in emergent virtual and metaverse worlds.

My article for +972 and talk at Palestine Digital Activism Forum began a conversation around Palestinian digital rights in emerging digital spaces. If the metaverse or AR/VR technologies become widely adopted, this could mean an intensification of the problems of the current internet, but in some ways, might pose entirely new challenges. Immersive technologies are inhabited and embodied differently, and activists should be meeting and strategizing as to what this means.

Digital Aftercare as care in the aftermath

'Virtual Keffiyeh' draws on my family history as Palestinian refugees who fled to Lebanon in 1948 when our ancestral village was ethnically cleansed by Israeli forces. As refugees in Lebanon, most of my family has neither Lebanese or Palestinian citizenship, living either in statelessness or hoping to immigrate elsewhere. Therefore, my care for Palestinian narratives and the threat of erasure comes from a family history of trauma caused by the violence of forced expulsion as well as the political and social invisibility of Palestinian refugee communities in Lebanon.

The ongoing threat of erasure, a consequence of the ongoing Nakba, continues to haunt and burden Palestinian communities with the fear of losing yet more land, loved ones, identity, wealth, culture, and memory. 'Virtual Keffiyeh' is a project that is motivated by the threat of the current and future erasure of Palestinian communities and narratives in emerging digital or digitalised worlds.

This project draws upon and develops my digital retooling methodologies. It also strives towards digital aftercares as a process of discovering new modes of care in posthuman, other-than-human, and nonhuman worlds and in the aftermath what has come before.

“OR:BITAL BLOOM”

A sustainability start-up / digital artworks / a virtual garden

Or:bital Bloom is a startup that repurposes environmental reporting data into digital artworks that bloom as sustainability targets are met. Our digital artworks express, incentivise, and archive transitions to carbon neutrality and sustainability. Our aim is to become a global virtual garden that thrives on meaningful, data-backed environmental action. As digital plantoid beings, Or:bital Bloom invites emotional connections, expressions of co-vulnerability, and accessibility to wide audiences.

Or:bital Bloom was a finalist in the Terra Carta Design Lab competition and earned an honorable mention as a ‘Highly Commended Project’. We exhibited Or:bital Bloom at the Terra Carta Design Lab’s ‘Finalists Showcase’ from April 28th to May 12th, 2022, at the RCA.

I started this project with RCA PhD students Dario Srbic and Shira Wachsmann. Currently, I am acting as CEO and Shira is the artistic director. Or:bital Bloom has joined InnovationRCA’s incubator program.



Fig. 29: Video still from ‘Or:bital Bloom: Video Pitch’

Overview

Or:bital Bloom repurposes environmental performance data into responsive digital artworks that bloom/grow/thrive as sustainability targets are met. As more companies and organisations make the transition to sustainability, data reporting becomes ever more vital in tracking and tackling the climate crisis. Or:bital Bloom uses digital arts to communicate the vitality of this data to audiences using creative, sensory, and immersive strategies. These artworks aim to inspire care for the planetary future, make environmental performance data transparent and accessible to the wider public, and normalise and incentivise data reporting in everyday life.

'Blooms' are both digital artworks that can be displayed on websites and social media platforms, and hybrid physical/digital installations that can be installed in exhibitions or company headquarters. Using gaming engines, 3-D animation, algorithmic tracking, and evolutionary algorithms, 'Blooms' grow and morph as environmental targets are achieved. Through our backend, which includes evolutionary algorithms and responsive design, our artworks are programmed to react to data from sustainability metrics. This can include carbon, energy, water, social responsibility, circularity, and biodiversity.

Or:bital Bloom combines the accuracy of data with new forms of digital storytelling. We want to marshal emerging technologies towards climate action. Our artworks can help to normalise sustainability reporting, establishing baselines for the transition to sustainability, and increasing transparency between corporate or state actors and the public.

Or:bital Bloom strengthens communication between the private sector and the public, by creating greater transparency and awareness around corporate adherence to environmental targets. Accurate sustainability reporting and data are key in meeting the challenges of the climate emergency. However, data alone cannot communicate the scale of the tragedy and what needs to be done to counter it. As we write in our deck:

Or:bital Bloom engages diverse stakeholders (stockholders, customers, employees, and the public) in tracking businesses' sustainability targets in real time, and encourages emotional engagement with tackling the climate crisis. By creating multi-sensory experiences, the impact of our product goes far beyond sustainability reports and quantitative information design.

Additionally, Or:bital Bloom aims to be a public virtual garden that expresses vast and diverse streams of environmental reporting data as an interconnected ecosystem. As data-driven storytelling, Or:bital Bloom's digital ecosystem expresses our co-vulnerabilities as beings on this earth in the face of the climate catastrophe. By creating a virtual garden, we incentivise companies and organisations to become virtual gardeners that meet and exceed their sustainability goals, while communicating this to wide audiences as transparently and accessibly as possible.



Fig. 30: Or:ital Bloom display at Terra Carta finalist exhibition. 3D printed sculptures by Dario Srbic

How it works

Or:bital Bloom uses digital art strategies and innovative technologies to help counter the climate emergency, interpreting vital climate and performance data into responsive artworks. Or:bital Bloom is developing both bespoke digital artworks that can be developed for specific clients as well as a scalable digital product that is software-based and can be accessed through our Orbital Bloom digital ecosystem.

The following points outline Or:bital Blooms main features and are adapted from our 2022 business deck.

- Businesses integrate their sustainability reporting data into our software suite, which updates automatically as newer data comes in.
- Inputs can be customised to include key sustainability indicators, including carbon, energy, water, social responsibility, circularity, and biodiversity.
- Or:bital Bloom uses gaming engines, AI, and algorithmic tracking to generate data-driven animations from environmental data inputs.
- Digital plantoid beings are programmed to bloom/grow/thrive as a company crosses key sustainability thresholds.
- Or:bital Bloom can be displayed either as a hybrid physical/digital artwork or in digital formats, including for web and social media.
- Each plantoid being represents a client in the Or:bital Bloom digital ecosystem. Customers subscribing to 'Bloom' or 'Terra' have the option of being part of our online ecosystem.



Fig. 31: 'Or:ital Bloom' mention in *Wallpaper* magazine

Timeline

We exhibited 'Or:ital Bloom' at the Terra Carta Design Lab's 'Finalists Showcase' from April 28th to May 12th, 2022. As a 'Highly Commended Project' we received funding of £10,000 from the Terra Carta Design Lab. We plan to use this to develop a prototype of our product and to develop additional materials to raise funds. We have received mention in the press including in *Dezeen*, *Wallpaper*, and *Design Week* magazines. We were invited to join RCAInnovation's incubator, where we will continue to develop and receive practical and mentoring support.



Fig. 32: My mock up sketch for Or:ital Bloom using generative art

Digital technologies can drive climate action, by revolutionising sustainability data reporting and marshalling network effects to impact environmental performance.

Or:ital Bloom creates a positive feedback loop between sustainability data coming from the natural world and what is happening in digital spaces.

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graph TD; A[sprout/sustain] --> B[bloom/thrive]; B --> C[seed/pledge]; C --> A;
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Fig. 33: Slide from 'Or:ital Bloom' deck

OR:BITAL BLOOM: TESTING OF DIGITAL RETOOLING

Or:bital Bloom deploys strategies from the digital arts and creative technological design to counter the climate emergency by digitally retooling existing technologies towards positive climate action and ecological good. This includes radically repurposing data reporting from informational and quantitative formats towards novel expressions capable of precisely telling the vital story of the climate emergency using innovative digital art techniques.

Or:bital Bloom exists as a developed proposition and business plan for the creation of data-driven digital artworks that archive and incentivise transitions to sustainability. As an ambitious project that combines data analytics, digital arts, animation/sound design, and algorithmic and AI-based programming, it has tremendous potential to generate new forms of knowledge at the intersection of the arts, digital humanities, and environmental/ecological design. However, even in its current state, Or:bital Bloom serves as an example of how radically rethinking the way that digital technologies function by applying digital retooling as a creative strategy can offer novel solutions for communicating important scientific and datalogical knowledge, tackling the climate emergency, and weaving together scientific knowledge and the digital arts together in new ways.

My work in establishing, designing, and developing Or:bital Bloom draws on themes and strategies formulated through my digital retooling methodologies, and links to other projects developed for this PhD study. This includes rescripting backend processes, changing hierarchies between qualitative and quantitative expressions, building co-vulnerabilities and networks of care, and rescripting the datalogical to consider emergent posthuman agencies through ethical automation.

Qualitative expression

Or:bital Bloom uses qualitative strategies to transform quantitative data into visual artworks that simulate the life cycles of digital plantoid beings. Audiences are incentivised

to see virtual blooms thrive, thus creating a positive feedback loop between what is happening in digital spaces and the natural world.

As more and more companies join or sign sustainability initiatives such as UN Global Compact, BCORP, UK PRI, and Terra Carta, they are compelled to generate increasingly more sophisticated and accurate sustainability data related to their environmental performance. This data remains largely inaccessible to the wider public, as well to the employees of firms and organisations. Or:bital Bloom transforms quantitative reporting into qualitative and artistic expressions that encourage emotional connections and care for the climate crises.

Qualitative experiences prioritise emotional registers and the phenomenological textures of multisensory events as having value in and of themselves. Or:bital Bloom's repurposing of scientific data into tangible and artistic expressions gives precedence to the qualitative in communicating the urgency of the climate emergency and making tangible the catastrophic resonances of the present and future planetary environment.

As in my work for 'Black Body Radiation: Rescripting Data Bodies', care for data bodies is demonstrated in Or:bital Bloom through the creation of data-driven digital artworks. Similarly, Or:bital Bloom also reverses Brian Massumi's description of digital capitalism as "the primacy of the quantitative over the qualitative" in financial markets, where "intensity (affect) and measure (data) are played against one another in differential relations."¹⁶⁷ The digital artworks proposed by Or:bital Bloom reinscribe the quantitative into a tangible space of care, turning care for the datalogical into digital artworks. The outcome is the production of intensity and affect from data, not the other way around.

By repurposing the datalogical into artworks and making environmental data transparent and interactive, Or:bital Bloom creates qualitative value around sustainability, as tangible care for digital creaturely beings. As data-driven storytelling, this allows scientific reporting to find expression as compelling narratives and artworks that make palpable the urgency of meaningful climate action.

Co-vulnerabilities & networks of care

My digital retooling methodologies emphasise the need to rescript digital spaces to account for the vulnerability of bodies and need for care. Co-vulnerability means recognizing the need for care in oneself and in others, refusing the logic of differential exposure to risk and suffering. In my work, to design for co-vulnerability in digital spaces means looking for ways to encourage mutual stake holding, sharing exposure to risk and insecurity but also joy and achievement.

I have developed concepts and frameworks of mutual stake holding through 'Black Body Radiation: Rescripting Data Bodies' and in Or:bital Bloom. Both projects locate digital artmaking as an act of care enacted with data bodies or in datalogical dimensions. As an act of care, these data-driven artworks introduce alternative forms of value that deviate from the purely economic or quantitative formulations of digital capitalism.

In Or:bital Bloom, we want to give value to sustainability, meaningful climate action, and care for the planetary future. This is realised through the creation of digital creaturely beings or 'blooms'. In our digital ecosystem, 'blooms' are vulnerable beings that need to be cared for; they grow as the tragedy of the climate catastrophe is diverted through meaningful data-backed action. The world of Or:bital Bloom wants to thrive and grow, but it is, as a default, a vulnerable world.

By rescripting backend processes to make environmental data transparent and interactive, Or:bital Bloom creates alternative forms of value around sustainability targets based on the primacy of qualitative experience, the power of data-driven storytelling, and a recalibration of care in digital spaces. Through the creation of our digital ecosystem, we hope to unleash the disruptive potential of care to proliferate. Drawing on my digital retooling methodologies, the design of Or:bital Bloom creates pathways for care to grow or circulate around ecological and environmental issues. As I wrote in my methodology section, this takes care out of indefinite sentimentality and into emergent and productive activity. This follows María Puig de la Bellacasa's formulation of care as a relational and disruptive undertaking. As she writes:

Staying with care's potential to disrupt thus is not (only) about making visible neglected activities we want to see more 'valued'—for instance, as 'productive'

activities with an economic worth that should be recognised. It requires engaging with situated recognition of care's importance that operate displacements in established hierarchies of value and understanding how divergent modes of valuing care coexist and co-make each other in non-innocent ways.¹⁶⁸

Rescripting posthuman agencies & ethical automation

Digital entanglements are made of human and non-human agencies nested together in strangely intimate ways. In my chapter on nested intimacies, I explore inward and outward manifestations of these entanglements, while examining how digital media blurs boundaries between inside and outside, self and environment, body and data. Or:ital Bloom creates digital artworks that blur what is happening in digital spaces with what is happening to the environment. In Or:ital Bloom's world, the datalogical becomes alternatively embodied as an artwork or digital being, becoming a strange and nested entanglement that needs human care to grow.

Following de la Bellacasa, I recognise that care has significance for more-than-human worlds. As she writes, "care is a human trouble, but this does not make care a human-only matter... affirming the absurdity of disentangling human and nonhuman relations of care and the ethicalities involved requires decentering human agencies, as well as remaining close to the predicaments and inheritance of situated human doings."¹⁶⁹

In Or:ital Bloom, care is not only a human trouble but a planetary one that addresses beings in the natural world, digital plantoid creatures, and ethical automation. 'Blooms' are scripted to respond to data inputs using evolutionary algorithms that use machine self-learning to execute morphogenic changes inspired by biological organisms. Therefore, 'Blooms' are both automated and can execute self-agency as self-learning creatures built on evolutionary algorithms and AI capabilities. 'Blooms' are built through the ethical use of data sets and automation that do not violate consent.

Our project differentiates itself from unethical AI practices that are built on data that violates or obscures digital consent. Big tech and the digital state have developed AI largely using nonconsensual data sets to train these systems, including: scraping the web for personal data, interpreting facial expressions without our knowledge, or collecting audible data without consent. In 2017, a piece in *The Economist* argued that the world's

most valuable resource is no longer oil but data.¹⁷⁰ Today, feeding machine learning's tremendous demand for data has made unethical data sets the dirtiest and cheapest oil of the AI age.

This project aims to serve as an example of ethical automation and AI. Our use of AI in this project is built on transparent, consensual, and ethical data sets that are vital in tackling the climate emergency. This sustainability data and the project's incorporation of it will be shared with the public in full disclosure and transparency.

Taken together, Or:bital Bloom's ambition and design contributes to my formulation of 'Digital Aftercares' as evolving new modes of care within technical systems that comprise human and non-human agencies.

My role as an artist

Or:bital Bloom develops my role as artist to encompass both the creation of digital and hybrid artworks and managing a business venture. I do not think that engaging in entrepreneurial or commercial activities is particularly unusual for an artist, as artists from Rembrandt to Louise Bourgeois to Theaster Gates have worked with commissions, patrons, architects, or engaged in other artist-run entrepreneurial ventures.

While founding and running a startup will undoubtedly bring new pressures and skillsets into my life, I do not think these forces compromise my work as an artist. Or:bital Bloom is a deeply creative and artistic venture. Our business is, at essence, the commissioning of data-driven artworks. This might take artmaking out of the conventional gallery system, but it does not take the artfulness out of what we hope to create as artists within this venture. However, the expanding role of my work as an artist in this project segues into the changing role of the artist in my practice over the course of this PhD study, which I discuss in my conclusion.

CONCLUSION: DIGITAL AFTERCARES

Intensification of the digital mediascape

As I began this PhD in 2018, much of this study takes place after the onset and rupture of the pandemic. Pandemic time brought panic, distancing, and the laying bare of uneven global exposure to suffering and instability. It also brought the unprecedented acceleration of digital life to privileged users, normalising everything from remote work and covid passes, to dating. Participation in digital systems no longer felt consensual or like something I could opt in or out of. In the same breath, being digitally connected to others took on greater importance in my personal life and work. As an artist, I felt I could no longer use digital media as a content creating or sharing tool, without challenging and rescripting the default states and plug and play forms of exploitation that come loaded into dominant media systems.

This PhD captures my work as an artist grappling with the intensification of the digital mediascape at a time of breakdown and differential vulnerabilities to hardship while looking for a new way forward in my work. This was a period of artmaking and unmaking, as it also brought the cessation of previous modes of my image-based practice. Going with this change and allowing myself to be troubled by the magnitude of unfolding events, my PhD research eventually opened pathways towards more agential outlooks and the development of digital retooling. My thesis serves as a record of my responses as an artist during this unprecedented time as well as endeavours to bring digital retooling to life as an artistic practice.

Digital retooling develops as a response to the digitalisation of daily life as well as to recover my sense of agency of an artist working within increasingly nonconsensual digital systems. To do this, my practice strived to differentiate itself from the image-based economy, data colonialism and digital capitalism, and to move beyond image and interface. Through the works and research that comprise this PhD, I develop new strategies, structuring concerns, and approaches to recalibrate my role as an artist working with digital media. My hope is that this study serves as both as an example and invitation

to other artists to adopt or adapt digital retooling methodologies in their practices, which I discuss in more depth in my section on digital retooling as a re:toolkit.

The concluding sections reflect on artmaking as toolmaking, the changing role of the artist in my practice, my relationship with the attention and image economy, this thesis' contribution to knowledge, and lastly, my final thoughts on digital aftercares as emergent modes of care in technical and digital systems.

Artmaking as toolmaking

Rescripting technology's default states through socially engaged interventions, the works I present in this thesis mark a transition in my practice from creating discrete artworks to artmaking as toolmaking. Through practice and research, I have approached retooling as a process which blurs traditional boundaries between practice, tool, and artwork.

The digitalisation of life presents itself as offering new tools to grow networks, enable better workflows, or help one find love or fortune— all while keeping the tool sleekly out of consciousness. The invisibility of tools adheres to a traditional view of tools as objects, as tools are generally considered to disappear from the scene once they get the job done. This aligns with notions of the tool in Martin Heidegger's work. According to Heidegger, the tool is invisible, it is given into being— and doesn't really become visible or conspicuous unless it is broken or somehow ecstatically revealed¹⁷¹.

What I mean by digital retooling does not follow traditional or Heideggerian thinking of the tool as something that is ready-at-hand or invisible, as this keeps the tool somewhat immobile and unchanging in its daily usage. Contrary to this, my research for this PhD has sought to bring digital retooling into focus as an explicitly not-invisible instrumentality, but as a designable, visible, mutable, and creative process. My artistic treatment of digital retooling blurs boundaries between tool, practice, and artwork, to make the invisible in technology visible. As a *retooling*, my methodology understands processes of hacking, reengineering, and redesigning as authentic and creative modes of making through *remaking*.

Through my development of new frameworks and imaginaries around digital retooling, I began to identify my artistic work with that of a digital toolmaker, returning to Ruha Benjamin's shift from using "technology as an outcome to toolmaking as a practice."¹⁷² As a toolmaker, I imagine creative and radically new ways of using digital technologies to change the way that media moves in the world from an artist-led perspective. The creativity and inventiveness that goes into this digital retooling process is what animates and drives my practice and research for this PhD.

Attention economy

Digital retooling does not correspond to the image or attention economy which demands that users generate content and images in order to turn the wheels of social media and other news feeds. My practice attempts to push back against the hegemonising influence of the attention economy which transforms all media into content that competes in a severely restricted visual format. Content might be critical or politically engaged at the discursive level but offers less opposition to the infrastructural determinations set up by digital media platforms. A digital artistic practice which engages with its own infrastructure can offer some resistance to hegemonic economic regimes, and perhaps tap into its own postcapitalist value as digital practice becomes unmoored from the large homogenising influence of the internet's current mega-platforms.

As I continue to orient and understand my work and practice in relation to digital media and the internet, I acquire knowledge and experience of the workings of affective capitalism, digital economies, and the production of value. My research on digital economies, art and finance, and value creation has enabled me to map locations and negotiations of power around my practice as well as respond to these multiple pressures through my work.

My research and publications during this time reflect my growing understanding of the relationship between digital media and contemporary financialization. Through digital media, financialisation extends into the personal, intimate, affectual, and social. New and

strange intimacies between affects and data, body and capital are brought to bear. As media theorist Jonathan Beller writes:

Because we know that computation has saturated life in all its pores, and because we know that computation is the sine qua non of contemporary financialisation—a financialisation that has also colonised life—we observe that such viral machinery, with a capacity to learn through accumulation, storage and retrieval of knowledge has expanded to absorb writing and all other social practice. Who or what wrote that program?¹⁷³

As financialisation extends into every domain of life through digital media, artists working with digital processes can offer new paradigms to make sense of this condition, which curator Victoria Ivanova and artist Gerald Nestler describe as a “technocapitalist biopolitics” that rests on “the automated exploitation of individualised affects.”¹⁷⁴

To further orient and develop my work as a digital artist I had to position my practice in relation to social media and the attention economy. As terms like ‘creator’ and ‘influencer’ have become more popular and less clearly defined in digital culture, I feel pressed to define my practice in both relation and contradistinction to this milieu. What it means to be a digital artist has radically changed in the social media era where artists find themselves toe-to-toe with influencers, creators, and brands. As massive social media platforms rely on advertising to turn profits, the creative and financial costs of content production are offloaded onto users to create the shareable and viral media that these platforms depend on. Even artists working with traditional, physical, or site-specific materials feel compelled to curate digital presentations of their work for online audiences.

Social media incentivises content producers to churn out work for reputational upticks and audience building, which can be precarious to monetise. As creativity is equated with visibility and content production, social media amplifies the bifurcation between artistic practice and technical infrastructures. If artistic practice hovers atop the technical layer, it is seen on one hand to transcend value and, on the other, to be exploited and underpaid. As artists contend with content creators and influencers, there is more pressure to compete, adopt, or distinguish these forms of visual practice, as well as combine or separate these practices to create viable sources of income.

Art historian and critic Isobel Harbison writes on the ways digital economies rescript how users engage with and create images. This impacts artistic practices which interact with new modes of digital and social production; Harbison focuses on performance and moving image within representational and economic regimes. For Harbison, the current internet's mode of digital economic production combines viewing with making, consumption with production. She labels this "prosumerism," the processes in which consumers simultaneously become creators, generating a creative economy that "markets itself as providing this transformative quality, with a capacity to support creative pursuits, to provide platforms for innovation and exhibitions, to turn consumers into artists."¹⁷⁵ As she writes, "prosumerism is the neoliberal model of twenty-first century labour par excellence where one's online viewing habits and information appetites are put to work."¹⁷⁶ Harbison surveys artistic practices that both criticise and are liberated by modes of prosumerism. She articulates this procedural ambiguity as "works and theory better situate prosumerism as complex, opaque, and value-producing; as the manifestation of the particular economic philosophies residing over it; but also, as an activity that might be exploitive and liberating at different parts of its process, depending on treatment, form, and on the prosumer's sense of or relation to power."¹⁷⁷

As a digital artist, my increased engagement with backend design, which includes digital infrastructure, ethical/political considerations, and energy consumption, has helped me differentiate my work from the image-based economy and retool elements of it, thus recalibrating my relationship with "prosumerism".

The changing role of the artist in my practice

To differentiate my practice from the image-based and attention economy requires deeper involvement with the infrastructure of my work as digital media. Becoming concerned with how my work moves in the world means constantly renegotiating my practice as an artist with the forces of financialization, productization, and monetisation in ways that are simultaneously pragmatic, speculative, transgressive, and creative.

To design new propositions and ideas as to how artistic media might behave radically differently has entailed expanding the definition of myself as an artist. In my current practice, this includes wearing the hats of creative technologist, digital designer, article writer, project leader, artistic collaborator, start-up cofounder, and activist. As I expand my existing skills or take on new roles, my sense of what I can accomplish as an artist to change the way dominant media functions becomes stronger and more agential.

My role as artist changes contours and emphasis depending on the scale and needs of my artistic project. In 'Bath Motes' I play the role of a speculative product designer, in addition to performer and editor; in 'Black Body Radiation: Rescripting data bodies' my primary role within the collaboration is to design digital infrastructures to interact with Ama BE's live performance, though I also am a video editor, narrator, writer and project developer. The works I discussed in chapter 3 continue to recast my role as an artist: as digital wearable designer, activist, writer, and co-founder of a start-up that specialises in sustainability-driven digital artworks.

By expanding my role as an artist and introducing new infrastructural or economic layers into my projects, I recover my sense of agency as an artist working against the grain of existing digital systems. Becoming more comfortable with backend processes, putting forth experimental and speculative propositions for digital artworks, and rethinking the way that media moves in the world, has reenergized my practice and commitment to it.

My growing sense of dissatisfaction with digital interfaces and images, led to the development of digital retooling as my practice as well as recalibration of my role as an artist in digital systems. Digital retooling addresses this critical shift in my experience as an artist feeling powerless or triggered in dominant digital mediascapes, towards rescripting agency through digital toolmaking.

Contribution to knowledge: a digital (re)toolkit

In this thesis, I present my artistic practice as recalibrated through digital retooling at a time of intersecting crises. This includes the intensification of the digital mediascape, the hollowing out of digital communities, and the advent of new forms of digital

exclusion, discrimination, and trauma. As digital aftercare, my methodologies aim to rescript agency, co-vulnerability, and value at a time of crises, at the crossroads of digital arts and social practice. This PhD serves as an example of digital retooling and an invitation to other artists to reconsider recalibrating their relationship with digital media across more creative and caringly disruptive lines.

My hope is that this thesis serves as a (re)tool kit for artists who want to experiment with digital retooling in their work, in particular, artists who to integrate social practice and digital arts in their artmaking. Integrative digital arts as a practice builds on research and experimental design to engage, resist, or rescript digital media's porous economic, social, and political layers for social, individual, or environmental good.

The structuring concerns that I describe in my methodology gather my situated understandings as a digital user with ethical and theoretical considerations, forming a matrix or toolkit of concepts, strategies, and questions through which my digital art projects emerge and develop. This is not to imply that every theoretical investigation undertaken for this PhD finds fruition as a definitive artistic strategy or discrete output, but rather that digital retooling as an artistic methodology has enabled me to take a more holistic, agential, creative, and critical approach to my digital arts practice.

My intention is that this thesis and accompanying works can serve as an artistic and theoretical toolkit for artists working at the intersection of digital arts and social practice, as well as for scholars of the visual arts interested in critical and creative digital practices. I hope the frameworks, new imaginaries, and practicable solutions that I offer through this research can serve as a repository or reference for artists interested in rethinking their practices through digital retooling. Therefore, it is my hope that this PhD can provide strategies, concepts, methods, and creative outcomes to be used or adapted by artists and scholars interested in digital retooling as an artistic practice. As a (re)toolkit, this thesis would be enriched by multiple perspectives.

As a summation, my hope is that this thesis and the artworks I am presenting for this PhD will propel artists working at the intersection of digital arts and social practice to become more involved with how their work moves in the world as media and to exercise their artistic agency more creatively, carefully, and disruptively in digital media systems.

Digital Aftercares as emergent modes of care

This PhD engages different modes of aftercare: as recuperation of agency, repair of relationality and community, and the creation of value around shared vulnerabilities. This draws from my situated experience as a digital user with C-PTSD as well as an in-depth consideration of how trauma-informed approaches can inform engagements with digital technology. Aftercares means learning to give care in the aftermath. Digital aftercares adapts this care to an increasingly digitalised world.

In my practice, making art during the course of this PhD study meant trying to make sense of a trifecta of events which troubled me greatly: the digitalisation of all areas of life, the injustices caused by differential exposure to catastrophes like pandemics or environmental collapse, and my own challenges managing my traumatic responses during this time. Digital retooling is a method that has energised my work as an artist and helped me recalibrate my sense of agency in relation to a broken, traumatic, and increasingly digitalised world.

My use of ‘after’ draws from Steven J. Jackson on ‘broken world thinking’ — who asks: “what happens when we take erosion, breakdown, and decay rather than novelty, growth, and progress, as our starting points in thinking through the nature, use, and effects of information technology and new media.”¹⁷⁸

‘Digital aftercares’ takes as its starting point that harmful and oppressive things have already happened, and engages an ethics of care by centering choice, agency, and liberatory paradigms in digital design. Aftercare is the default mode of care that is required coming out of oppressive dominant digital media systems. ‘The ‘after’ is what might come next in a relationality between the datological and the bodily, the human and nonhuman, that has moved beyond violative relationalities and traumatic othering towards new caring agencies. As recuperation, ‘digital aftercares’ means living with traces of trauma while reclaiming agency, relationality, and self-possessed embodiment as a mode of ongoing convalescence. ‘Digital aftercares’ is more than relief or analgesic soothing; it is about continuously retrieving care, community, and agency in the long aftermath of the traumatic. In living with agency and relationality in the traumatic aftermath of all that has

come before, digital aftercare is recuperation, transformation, and preparedness for what might come next.

APPENDIX

Grace Quantock interviewed by Ameera Kawash

Ameera Kawash: Your MA thesis was on how body-oriented counselling/psychotherapy can be mediated digitally and your current work continues to develop trauma-informed approaches to digital media and design. You speak about some of this work in the video 'Data and Trauma'—the need to design trap doors, exits and entrances, and clear choice points for users with higher trauma loads. This counters the feeling of being inside a system or information architecture that is designed to trap, enclose, and manipulate user attention. Could you say a bit more about how users with trauma loads are especially at risk of feeling triggered or othered by this kind of digital architecture? What kind of architectures make up a trauma-informed digital space?

Grace Quantock: The thinking on trapdoors comes from my mentor, the inclusion producer and founder of inclusion agencies Zahra Ash-Harper, who I met at the Pervasive Media Studio at Watershed in Bristol, where she mentored me in my first digital place-making fellowship. Her work has got a lot of trapdoors, and that's where my thinking around that really comes from. In terms of how users with trauma loads are especially at risk in this kind of digital architecture, I think it's about consent, agency, and power. As a neurodivergent person, I can become really disoriented and unsure in environments that I don't know. Historically I would look for videos of the facilities I have to go to. I would often find that particularly people tend to make

videos for new builds, and they're like, "oh, we'll do a walkthrough of our new ward." I can look at that, even if it's, years later and can see: where are the doors? Where are the pinch points in the corridors? Where are the lavatories? What looks like a quiet space I can go to? Where's a space I really don't want to get stuck?

So, what happens when we don't know where these things are? If people are being detained against their will, if they've been trapped psychologically, or literally, then knowing where and how to get out, and how to escape what we feel is a rising claustrophobia can be really necessary. And it's about agency, do I have the agency to choose to go forward? Or am I being taken on a journey that maybe has been designed for me, but not with me, or to get me to a certain point rather than for me to have a certain experience that I want to have.

People want to have intrigue or mystery in a way that they can contain. You might look at the end of a book or a film, and then you know you can do that, you can pause the book. You can just Google the end of it, you can fast forward the film, you can stop something. Often, we seek these experiences of mystery or uncertainty, but in a particularly contained way. And media, particularly episodes can be really good, because it's like a 20-minute contained experience. So that can be really useful.

I think it's about power. If diversity is asking everybody to the party, the right people, then inclusion is: do the people who are invited get to invite other people, do they get to choose the food and the music? And then social justice is: are we starting to

think, like, why are we having a table? Why are we having it inside? Why are we having it at 5pm? Why don't we have it after sunset on Ramadan, so that people who are fasting can come, etc? I think in terms of trauma loads, I think it's less about what the trauma is, like is somebody a survivor of rape or domestic violence or hate crime? I think for me, it's less about listing the kind of experiences of trauma and more about thinking about the conditions in which traumas get aggravated. So, issues of things like consent, agency, power, location, orientation, environment, regulation, and dissociation, all of these kinds of things. I think the kind of architecture that makes up a trauma-informed digital space is one that has consent and agency, and containment that can be controlled. Some people really want an experience of following a journey, like they really crave it. But I think it links to BDSM and kink movements, that people may want to experience certain types of sensations- but there's huge amounts of emphasis on consent.

Ameera Kawash:

It's interesting, I just read an article about a researcher named Emma Shepard. She is looking at BDSM practices among people with chronic pain and how they are using it to be able to control the volume of pain that they're already immersed in.

Grace Quantock:

Yes, I can imagine that. I mean, I remember a friend of mine who was on chemo, she got stung by some bees, and her partner was really upset. And she was like, "No, this is like this tiny pain that, I can kind of control like, I can put a lotion on it, and I can ameliorate it. And it's contained in just as one part of my body. This is amazing." And she kind of quite liked it. Obviously, she didn't choose to get stung by the hornets. But

there is something of that kind of that limitation of it, it's a pain that, is contained in one place, and you have some level of something you can do so yeah, absolutely. I completely see that.

Ameera Kawash: Yes... as you were saying— there's a shift away from the content of trauma to the agency and empowerment based on understanding the overall mapping. In BDSM and kink practice, there are clear entrances, exits, there's aftercare, safe words... and of course agency is key.

Grace Quantock: It's really kind of kink oriented now that I hear you say it. I'm an LGBTQ plus affirmative therapist, I'm polyamory friendly, and kink friendly and informed and will work with people with all of these experiences, and but as you're talking about it... things, like, planning, consent, aftercare, like all of these are real tenants of kink as well.

Ameera Kawash: In the 'Data and Trauma' video you talk about a few triggering or difficult experiences that users with higher trauma loads have experienced with AR/VR, as well as your own account of such an experience. I am both wondering about trauma-informed approaches to AR/VR, especially given all the current hype around metaverse platforms. Have you worked with trauma-informed approaches in this space? What kinds of new considerations do virtual reality, AR, and metaverse spaces bring—as these operate under a different sense of embodiment and dis-embodiment? I know from my own experience that I have often felt these spaces to be dissociative.

Grace Quantock:

This is a really good consideration. For me, a lot of this work is based on the work of Tim Lytc, who I worked with during the fellowship that I first met, Zahra Ash-Harper in. Tim did a lot of work with Lumina cinema around VR and moving in and out of VR spaces, which was really important. And having some inner sense and experience of that, I think, is a really big part of how we do this in a safe and trauma-informed way, of that transitioning. They were looking at combining dance and movement with creative technology to make safer spaces for queer folks. But a lot of their work is about how to move safely in and out of these spaces. I think there's something here about transitioning in and out of... but then we start asking what is in and out? And how do we transition in and out of our own bodies and experiences because there's also that dissociative and embodied experience of transitioning in that, that as well.

And so when you ask this, what I wondered about is, where do we locate the metaverse? Is it internally or externally located? Because it's not located in the device. It doesn't just live in like a little box that we kind of live in; if you shake the phone or the computer like that you wouldn't want to fall over. So where does it live? And I know when I used to do teaching, we talked about the meditations and the mindfulness practices. And I'm always really careful to locate those in us internally. Because often when you do a mindfulness practice, it's kind of like, imagine a place, often a natural place like a meadow or a beach or a forest...and go out to that place. And one of the ones I first learned, you had to like, go down this long stone corridor, and then there's a door at the end of it, you could feel the warm handle of the wood. And you stepped out into the meadow. It

was very dissociative. But what I try and do is ‘find a neutral space in your body’, like find a space there and we are going to find a world that lives inside you, which you can do stuff in.

So that’s my first question, where do we locate the metaverse: internally or externally? And how is it held internally or externally? Is it contained? Is it kind of sprawling? Where are the edges? Can you fall off? Can you fall out? Can you fall in again? What happens with that? And then also how does the body responds to Metaverse VR when you’re there? Because, how your body responds to what happens there and how it’s processed?

Years ago, when I was very sick and bed bound, and my partner really kindly collected from charity shops, all the videos of Buffy the Vampire Slayer— that was quite a long time ago. And they were in a box inside the bed and he’d go into the box every day and I was like, “What are you doing in the box?” It was a secret. But when I watched the videos, it did not go so well. Because my body responded... so I responded viscerally to what Buffy was fighting. And it was like I was experiencing it. So here we can see some level of that struggle of differentiation, the boundarylessness, the porousness, the kind of dissociative elements of my experiences here, but it’s not that unusual for us to not be able to differentiate between what we see and what we experienced here. This is why we get feelings when we read or watch things. I admit, mine is possibly more dramatic. And it seems to have elements of mirror touch synaesthesia in it.

I think many human bodies respond to what happens in the media we're consuming. And how is it processed, like with my Buffy video—I had to stop watching them because I kept responding as though I were Buffy, except Buffy was able to run away and fight the vampires. Whereas I just sat there as though I was trapped by the vampires. So, it just did not go well. And my heart rate would soar, my blood pressure would soar, I would sweat, I really have huge physiological responses to the media in a way that my body really couldn't tolerate, because the reason I was stuck in bed, watching them is because I was so sick. So, I mean, when people are doing this, how is their body responding? Their body experiences might be much subtler than mine. But the body is going to be doing something when we are having these media experiences. So that's really interesting. How is it processed? How is it engaged?

And also bearing in mind—like we said about some people using BDSM to manage chronic pain—some people use these non-physical experiences as a form of pain relief. They actually use them as a dissociated form of pain relief, to go into the game, to go into the metaverse, to go into VR to actually consciously dissociate or unconsciously, but purposely dissociate from the body, the pain, or whatever else they might be escaping in their body. But you have to at some point, go back into the body, and then tend to it or advocate for it in a medical situation. And that's tricky then because now you've spent a lot of time out of it, it can be really hard and you've learned, potentially, to ignore it.

Ameera Kawash:

So back to the transitional... it isn't like a total hard cut. I was thinking when I wrote this question, I was spending some time on metaverse platforms. I had so much trouble sleeping, that whole week, my mind just couldn't shut that space down. And there aren't really transitional ins and outs in these productised or commercially available experiences—there isn't really a cool down phase.

Grace Quantock:

Which I think you would have, if you were doing it in the physical and the non-virtual space, like, if you wander on the streets in the physical space: you have to get up, you have to get dressed, you have to get your keys, you have to get your bag, or whatever you might need, you have leave your house, lock the door, walk down stairs, or ramp or elevator or whatever it might be, and then get outside—that is the transition.

We try, I think, to minimize the transition, because we want this whole seamless experience, because we don't want people to be going like, "Oh, my God, I have to, like, login, and then use a code, like, forget it, I'll just go on to one that doesn't make me login and use a code," and I get that. A lot of virtual classes, things that I've done, we've started doing something which I learned to do in a uni online workshop, where afterwards, after the workshop finishes, we just kind of have half an hour or so where people just have their zooms on. You're not necessarily sitting there chatting, but you're just present with each other. So, we just try and give people that alongsideness with each other. And that you're watching things kind of get transitioned, and yeah, built back down again.

But just also acknowledging that when people are escaping into these places, it is problematic. I think all pain relief has side effects. And a lot of pain relief has a side effect of being cut off from our body. Like, where's the transition with painkillers? They don't have a transition do they, we just get cut off, or it runs out, and then you have to take more, or you feel it wearing off and it's not time for the next one yet, or whatever. So, I think a lot of things don't have transitions. And people deal with that in ways of trying to stay in them, stay in them, stay in them, as long as they can until it can't be sustained anymore, for whatever reason, and then you fall out. And that's a problem. But like, all pain relief seems to have some side effects. So, if living in your video game helps you more than trying to get meds from a doctor who is unconvinced that... who like, I don't know, keeps saying like, "have you tried mindfulness and yoga?" And then maybe that's easier for you.

Ameera Kawash:

That feeds into the third question, which is about the blurring of the inside and outside and why that would be problematic with people with higher trauma loads. What about the datalogical layer and how that is operating in terms of ambiguated consent, and just this feeling that there are these background processes at work all the time? And you're not really sure what they are. They're not part of the visual map of the space. How does that contribute more stress to users with higher trauma loads?

For example, a personalised algorithm captures data about what posts you like, or how long you linger over an image, and these feed into a datalogical layer which curates digital experiences

around these preferences. This process inherently blurs boundaries between what is datalogical and personal, digital and bodily, outside and inside. In this sense, digital media engagement seems less like an external tool, than something that becomes deeply embedded in one's life. This also gives digital media a feeling of being strangely intimate as it is connected to memories, friendship circles, and affectual/bodily states, and yet also violates this sense of intimacy because so much of it is nonconsensual, without what you call clear choice points or happening in an invisible or shadowy way. As a user with C-PTSD, I have struggled with these elements: blurring of outside and inside, a feeling of violated intimacy, and of not being able to trust background processes and shadowy third parties.

Do you see intimacy and this kind of blurring of boundaries as part of the way digital media functions (as it is more connected to bodily/affective states than other media)? Is there a way to reconceive this intimacy with the medium itself in more consensual and beneficial terms?

Grace Quantock:

It is such great question. And I think for this in terms of the datalogical layer, it's that invisibleness. But I think, it speaks to other invisible layers that we experience when we engage. So, we're talking about these "digital streets." Like all these "Twitter streets." And there's the invisible on Twitter, which is the algorithm, gathering, harvesting of data, and the curation of our digital experiences that shapes them. But there's already an invisible layer that exists in the physical streets as well. And those invisible layers are ableism, racism, sexism, and,

obviously, many forms of racism including anti-Semitism, homophobia, transphobia, and class issues. When I go out in a physical street, my journey through those streets is already shaped and impacted by the physical architecture, by what people have built that isn't physically accessible to me as a wheelchair user, by what places I can and can't go, and safely, as a woman traveling alone. And even if I'm aware of these invisible spaces already, I need to really be transparent.

I like what you asked about the blurring of intimacy and the blurring boundaries. And is there a way to re-conceive the intimacy with the media itself and more consensually. And I feel like that is a way to reconsider it with clarity around ownership over data and how it's used. I think my data is so valuable and so manipulatable... I don't see how we can get the organisations to not use it. Particularly now that they've tasted it.

It is like, if I chat on Twitter... I actually think of chat, tweets, write them all down in a list, and then program them a month in advance at a time. I put them all down. Then, they sit there for a bit. And then, when I come back to program them in I'll refine and tweak. But it's very much public persona because it's part of my professional work. It's a bit like when I am with a client; if I share a personal example or story from my life, and sharing it only because I believe it's in service to the client not because I want to share it or I want to be heard and seen. I have other places to share, be heard and seen, that are not clients and not social media. They're not really part of my way of being in the world—that's professional. But that's not how most people use

it, and I'm aware of that. So that's not about the datalogical, but that's about my sharing.

That's my personal map of using it, like we said. But that's not about the datalogical layer. I suppose, I tackle the datalogical layer of what they know about me, by using social media for business only. So, I don't have personal, and it can all feed into hypervigilance around what I do and don't share. It all feels very high stakes.

I also wanted to say like, it's familiar, this untrustworthy intimacy, that you talked about. And it actually reminds me of hospitals or rehabilitation centers, where there's a sense that like, we're all friends and we're here to help you. But there's a level in which they're monitoring you. And when I was in hospital in 2017, at one point, the consultant came up to me and he said, "the physio told me that you were seen crying." I said, "Yeah," and he said, "If you keep crying, we won't let you go home." I was like, "What? I'm in the stroke ward. I'm not in the psych ward. Why are you saying this?" And actually, the consultant—and I got out and it felt like getting out—"the consultant said to me, "I'll let you out. I'll discharge you if your husband agrees with you." And I quote, he says something like— if my husband says I can leave, he'll let me leave. And I was like, it's 2017! What the hell are you talking about? But I just went "fine, I'll take that bet because I've met my husband and you haven't. So, you have no chance on this earth of convincing him to go against my wishes." So I just went, "yeah, sure.. go for it!" And so he actually asked my husband that. My husband said, Grace "has the authority on her own

experience... If she thinks it's safe for us, then I will take her from the hospital." So, he couldn't convince him and actually, to be fair, he did then discharge me. But I was just like...this was a space without clear choice points, like quite frankly, I've had clear choice points and clear understanding of the system of getting out when I've been detained in police stations, rather than in hospital.

I think digital media is contained, but it's always connected. So, like, you're looking on Instagram, you're watching videos on your YouTube, whatever. It's aware that it's always connected to what you're doing. Whereas a book is contained, but it's not connected. And digital media can be responsive in a way that's invasive. Because it's doing it if you want it to or not, like Amazon is aware of where I stopped reading the book on Kindle. And the parts I skip over. Now they're not providing that information to authors, which I think would be very useful to the authors—cause I'd love it! I think if the authors knew that everybody skips chapter three, because it's bad, that could be really useful information.

But I think all media connects to bodily or affective states on some level, but digital media in this way is the monitoring, the unceasing engagement. And so, you know, I'm trying to work with this, like with trauma toggle, the research I'm working on through Cardiff University and with BBC.

Ameera Kawash:

Okay. It seems on one hand that trauma-informed approaches are very much an accessibility issue, as users with higher trauma loads struggle or are triggered because they are not considered

during the design process. On the other hand, the whole system architecture of mass social media is extractive, advertising-driven, and relies on nonconsensual or ambiguously consensual processes; the problems lie so much deeper than the user interface.

I guess this has to do with the divisions, the visible and the invisible, and the sort of political dimensions of the visible and invisible in digital media. So, on one hand, trauma-informed approaches are very much an accessibility issue, as users with higher trauma loads are not often considered in the design process. But on the other hand, it seems that the whole system architecture of social media, in particular, is extractive and advertising driven as it exploits this sort of differential between what's visible and what's not visible. So the problems go way beyond the user interface.

In terms of your own thinking, how do you approach a trauma-informed design as an accessibility issue? And then, what could be seen as an expanded trauma-informed approach, which calls for more radical and political engagement or retooling of these technologies? Do you think that these technologies, including the datalogical, can be retooled in a radical way that would make them more beneficial to users generally?

Grace Quantock:

I don't think I've taken a trauma-informed technology approach to social media, mainly, because as you say, it's so abstract and problematic. I take the trauma-informed approach to how we engage with and use it. Like I've been talking about in terms of our maps, our ways of engaging. So, what I do on Twitter is,

like, I schedule what I do, but I also have Twitter lists of people I engage with. I will not just scroll on the timeline. So, you know, it's a very curated approach, I think, a trauma-informed way to using it but I haven't taken one to the design of it because I just don't think there's been the appetite or the aptitude from social media companies. I've not seen any evidence they're interested in making any change. And I try to work with people who want to make change and are too exhausted to do anything else.

So, I kind of see this as, like as I said I used to do activism, and part of that was animal rescue. And there were kind of two approaches people used to take, which really stuck with me. So, the one approach: people would try and close the puppy farms and get fur banned and etc, etc. And they would try and shut down or legislate to stop what was cruel or unethical. And then other hand, people would run animal sanctuaries. So, they would look after the dogs that had been abused in the puppy farms, or they would look after the animals that had had, like, industrial paint stripper tested on them, or whatever it might have been done. And so people often tended to do one or the other. And the difficulty was, you know, if you're fighting to stop the harm, it can feel never ending and you're always at that kind of frontline of it. And it's very...it's just a lot because it is often very harsh, because they're making a lot of money and they really want to keep doing it and making that money. And if you're at the rescue end, well then you just realise that you can live and die and it's never going to stop these animals from being harmed.

So, what I try and do now is: while the systems are here, here's how we're going to try and make them as non-harmful as possible; here's how we're going to teach you how to navigate them in a way that doesn't harm you as much; and here's how we're going to work for a deeper overhaul and deconstructing of the systems. I have worked in systems that I think should be broken down and stopped, but while they exist, they need somebody in there who's at least going to try and put the brakes on and ameliorate the harm that they're causing. And it's a really tough one. I hate a lot of that aspect of it. But I will hate more to see them do that harm without somebody there to do anything about it. So I guess I'm with both. But then we get to the approach in my work of how in inclusion production in digital spaces, we can successfully influence people in positions of power towards inclusion and digital transformation.

I have one more story, which is one that I discussed with my clinical supervisor, the whole animal rescue / stopping the harm thing. And he told me a story of two monks, which is: they were going along the river in a rowboat and they saw somebody drowning in the river, they jumped in and got the person out, dried them off and carried on. Then they saw another person drowning and they jumped in again. And this kept happening. But the monk in the rowboat was saying 'well, where are you going? Why don't you come and help?' And the other monk said, 'I've got to go and find the bastard that's throwing them in!' And so there's different ways to help, and I guess I'm trying to do both; I'm trying to both help people who are in the river and try and stop the people throwing them in. Because otherwise I don't think I'd be able to cope. I'd get too exhausted

going in the river and I get too exhausted trying to stop... failing to stop people throwing them in and watching people drown. So I have to try and do a bit of both to be able to cope.

Exhibitions, Publications, and Talks 2019-2022

Exhibitions

Upcoming exhibit
Preview of "Black Body Radiation: Rescripting Data Bodies"
RCA September show
September 23 — 28, 2022

Exhibited "Or:bita! Bloom"
Terra Carta Design Lab Exhibition
Dyson Gallery, RCA
April 27— May 12, 2022

Exhibited "Diasporic Objects and Irritable Matter"
'1 Object: An online exhibition of MA RCA Sculpture students'
Group show, Freud Museum
March 2021-2022

Exhibited "Lampedusa"
RCA School of Arts & Humanities Research Exhibition
Dyson Gallery, RCA
March 15-23, 2019

Publications

"The occupation enters the Metaverse," +972 Magazine, February 2022.

"Money-Go-Round," Real Life Magazine, January 2022.

"Strange temporalities: elsewhere, post-traumatic stress & digital flowers,"
in *Care(Less)*, edited by Gemma Blackshaw and Sharon Kivland. London: MA
Bibliothèque, 2021.

"Post-genius memes: copyright, consent, distributed authorship and NFTs" Clot Magazine,
November 2021.

Talks/Presentations

Palestine Digital Activism Forum / "Occupation and Metaverse"
May 18, 2022

RCA Research Biennale / 'Yomiyat: Roundtable on digital diarising'
March 1, 2021

Across RCA / "Trauma-Informed Approaches to Arts, Design, and Critical Theory"
February 25, 2021

'i Object' at the Freud Museum / "Seminar on the Traumatic Object"
February 16, 2021

RCA Doctoral Training Week / "Cultural Ecologies of Beirut"
September 14, 2020

RCA Student Union / "Organs of Thought: Diagrammatics and Visual Organization Out of
Chaos," with Adrian Gouet
January 22, 2020

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