A Bestiary of Distributed Intelligence: Topologies of Fascist Emergence

Submitted for the Degree of
Doctor of Philosophy, School of Arts & Humanities

Royal College of Art
2024

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Word count: 39’957

Abstract

This thesis investigates the materialism of distributed forms of synthetic intelligence and characterises the paradigm shift implied by the proliferation of AI technologies. It examines the ontological politics of AI's analytical, generative, and learning processes, exposing the metaphysical burdens embedded in AI architectures and infrastructures. The thesis analyses the transformed economy of meaning production and distribution in contemporary knowledge systems, which differ not only from the pre-digital past but also from earlier forms of algorithmic circulation. Without ascribing inherent culpability to AI for exclusion or social bias, it explores how AI can participate in the reproduction of fascistic logic, focusing on AI-generated simulacra, their circulation dynamics, and their topological transformations. The synthetic structures analysed are approached as complex, multimodal, distributed systems far from equilibrium, studied through complexity science and the tensions between old and new materialist philosophies. The philosophical investigation is grounded in art practice, involving the poietic manipulation of AI systems and experimental engagements with generative algorithms.

Chapter 1: *The Book of Meat* vivisects the materiality of synthetic circulations, exploring how fascist seduction and the clustering of exclusionary content operate within distributed synthetic systems. It analyses forms of cohesion that emerge across multiple simultaneous logics, enabling rapid shifts, cascading effects, and break-offs of meaning. Moving away from post-psychoanalytic and instrumental interpretations of fascist mass psychology, it instead emphasises the sensuous dimensions of violence and the mimetic pleasures that emerge through the circulation of algorithmically generated media.

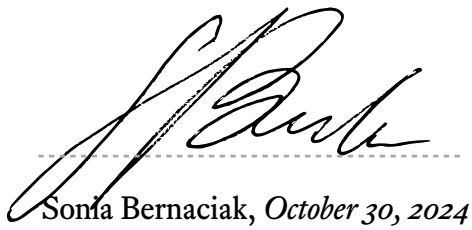
Chapter 2: *The Book of Clouds* proposes an original reformulation of mood as a material orientation of the political, always situated in the systemic present, rather than expressible only through future or past modalities (neither foretaste nor aftertaste). Building on Heidegger's "mattering to," Golding's "return of difference," and Sharpe's *Wake*, it presents mood as a plural "turning": an emergent, distributed mode of motion comparable to a tensor field. This redefinition enables the identification of new emergent forms through which exclusionary atmospheres are captured and perpetuated across the architectures and outputs of generative AIs, particularly through pre-established and applied "styles".

Chapter 3: *The Book of Worms* investigates AI's relationship with contingency, novelty, and undecidability, examining the generative logics of large language models and, more broadly, stochastic AIs. It critically interrogates the claim that AI is inherently regurgitative, questioning whether synthetic intelligence can produce logical leaps rather than merely recombine learned patterns. Through experiments with *Polymorph*, a physical, complex adaptive AI system developed collaboratively at AIDLab, the chapter argues that the logic of reassembly is not inevitable. It demonstrates that AIs attuned to their physical circumstances and not constrained within linear architectures can develop emergent, self-organising, and exploratory behaviours.

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 thesis.

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



Sonia Bernaciak, *October 30, 2024*

Acknowledgements

This thesis is dedicated to Brian Catling who invited me to be a part of his pedagogical bestiary.

I would like to thank Professor Johnny Golding, my Primary Supervisor, who showed me that villains 'don't have to be the most interesting characters in the room.' Thank you for teaching me the rigour, courage, and poietics of philosophy.

I would also like to express my gratitude to Jonathan Boyd, my Second Supervisor, for helping me grasp the meaning of material experimentation.

This thesis would not have been possible without the support of my colleagues at the AIDesign Lab. Jeremy Keenan, your talent and the originality of your thinking have been a constant source of inspiration. Maggie Roberts, thank you for reminding me of the joy, curiosity, and strangeness of art practice. I am deeply grateful to both of you for your encouragement, humour, and support through the most challenging moments.

I would like to thank my fellow researchers at the Royal College of Art from the Entanglement group: Mattia, Barnaby, Dario, Julia, Shira, John, Roshana, Hannah, Linn, Emily, Suchitra, Despina, Col, David.

I would also like to thank:

Bruno Klopott for guiding me through the exciting side of pragmatics and helping to animate even the vaguest sketches.

The Antikythera think tank and Benjamin Bratton, for challenging and humbling me in numerous ways.

Arieh and Stephen Frosh, for their guidance in the early stages of this work, and Magdalena Klopott, for her support during its final phases.

My father Krzysztof for his patience.

And finally, my mother Mira, for her wisdom and curiosity — thank you for waiting to see the end of it.

Table of contents

Table of figures

Introduction

A bestiary of distributed intelligence is a practice-led onto-epistemological investigation into the matter of synthetic wisdom at the verge of what is called the Fifth Industrial Revolution.[1] The recent development and proliferation of AI technologies has caused a paradigm shift in how knowledge is generated, circulated, and distributed, reshaping the very cognitive frameworks through which intelligence is understood.[2] This research examines the relationship between the rise of autonomous and semi-autonomous algorithmic systems and proliferation of anti-democratic, populist and exclusionary logics.[3] It addresses accusations that equate the non-human with the inhumane and explores what is being automated, generated, and embedded within the architectures of AI through the process of artificialisation, questioning how this may

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[1] The term of *Industry 4.0* emerged in 2011 at the Hannover Fair, where scientists advising the German government envisioned a future of manufacturing driven by computerisation and machine learning. This vision was later popularised by Klaus Schwab, who expanded on it in his book, *The Fourth Industrial Revolution* (Geneva: World Economic Forum, 2016), highlighting the transformative potential of automation. With the rise and democratisation of AI systems, tools and platforms, the focus shifted to *Industry 5.0*, which prioritises the integration of human-centric AI, aiming for alignment with human needs and values. This perspective is supported by European Commission discussions on "Industry 5.0," *European Commission: Research and Innovation*, 2020, https://research-and-innovation.ec.europa.eu/research-area/industrial-research-and-innovation/industry-50_en, See also: Rushan Ziatdinov et al., who explore the definition of the Fifth Industrial Revolution in their article, "The Fifth Industrial Revolution as a Transformative Step," *Societies* 14, no. 2 (2024): 19, https://doi.org/10.3390/soc14020019.

[2] A similar diagnosis was presented in reference to algorithmic technologies in the introduction to *Data Loam: Sometimes Hard, Usually Soft*. Here, it is reconsidered specifically within the context of the rapid proliferation of AI generators. See: Johnny Golding, Martin Reinhart, and Mattia Paganelli, *Data Loam: Sometimes Hard, Usually Soft. The Future of Knowledge Systems* (Boston: De Gruyter, 2020).

[3] Chapter 1 explores the boundaries of autonomy and semi-autonomy in algorithmic systems in detail. Here, it suffices to say that by 'autonomous,' I refer to systems that function independently of direct human intervention, while 'semi-autonomous' denotes systems that operate with partial human oversight or input.

contribute to circulations defined as 'fascistic'.[4] The synthetic systems here are analysed through five original philosophical constructs: *semi-autonomous simulacra*, *mood*, *phase slip*, *systemic frustration* and *topological phase change*, each addressing different facets of distributed intelligence, as well as through the experimental framework of a complex adaptive AI system *Polymorph*.

Synthetic Infrastructures

The anxieties surrounding AI technologies echo the earlier fears associated with a singular, omnipotent, and omnipresent Algorithm, which was the one previously perceived as a potential threat to an ambiguously defined human essence.[5] While it is important to recognise that not all criticism of AI is inherently reactionary or rooted in neo-Luddite sentiment, much of the discourse on AI alignment—focused on synchronising AI with human values and cognition—reinforces a false dialectic between the human and the artificial.[6] This framing attempts to define AI in opposition to so-called organic intelligences, inadvertently conflating a diverse array of algorithms and AI systems into a monolithic, undifferentiated synthetic 'other.'[7]

In reality, AI models, platforms, and tools—integrated into digital and pre-digital technological infrastructures—do not form a unified or consistently synchronised synthetic layer. Instead, the evolution of computational cognitive architectures reveals a diverse ecosystem of varied intelligences, each operating with fundamentally distinct languages, codes, timescales, sensory inputs, and outputs.[8] This multiplicity challenges the reductive view that positions AI as a singular entity opposing human intelli-

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[4] For a philosophically robust, albeit contrasting, formulation of this position, cf. Dan McQuillan, *Resisting AI: An Anti-Fascist Approach to Artificial Intelligence*, First Edition (Bristol: Bristol University Press, 2022).

[5] Taina Bucher discusses the common logical singularization of multiple algorithms into 'the Algorithm,' a singular entity that listens, knows, and predicts. Taina Bucher, *If… Then: Algorithmic Power and Politics* (New York: Oxford University Press, 2018).

[6] Cf. Jiaming Ji et al., "AI Alignment: A Comprehensive Survey" (arXiv, May 1, 2024), https://doi.org/10.48550/arXiv.2310.19852.

[7] Several contributors in *Atlas of Anomalous AI* critique the tendency to define AI as a monolithic, synthetic 'other,' suggesting instead that AI systems embody diverse forms of intelligence that blur distinctions between human and artificial cognition. See Ben Vickers and K Allado-McDowell, eds., *Atlas of Anomalous AI* (London: Ignota Books, 2021).

[8] Benjamin Bratton, "Cognitive Infrastructures: Synthetic Intelligence in the Wild" (London, CSM, March 7, 2024).

gence. In line with the thesis's central argument, digital environments, including multimodal and multi-model AIs, digital infrastructures, and online spaces, must be analysed not separately or in parallel to politics, but as an inherent part of the political.

The Fascistic

Therefore, the understanding of the fascistic employed in this thesis is framed through its systemic characteristics, rather than the symptomatic features tied to specific historical events. It draws significantly on Johnny Golding's formulation of the fascistic, which she defines as a form of circulation characterised by the following interconnected elements: **1)** it relies on the mass dissemination of information, enabling rapid spread throughout the system; **2)** it operates under the logic of a nation, state, or organisation conceived as a closed totality maintaining static stability; **3)** it turns the system against itself, often emerging from democratic or collective initiatives; **4)** it assumes that totality replicates itself unchanged, making radical transformation—a reconfiguration—difficult, dangerous, or impossible; **5)** it introduces a zero-sum logic in its systemic reasoning, especially regarding resources; **6)** it functions through the othering of elements, people, or groups, positioning them as alien, unnecessary, or detrimental to the system, thereby reinforcing a rigid distinction between the systemic inside and outside.[9]

The thesis, following the majority of those points, states, however, that the homogeneous closed totality that fascism ends up installing is one of its final phases, rather than an overarching logic. In that sense, the thesis adapts Deleuze and Guattari's (D&G) differentiation of fascism from State-run totalitarianisms. Following Virilio, they propose that fascism with its affirmation of so-called total war is realisation of the *war machine*, a destructive, destabilising force that through the State-imposed homogeneity drives the system (State) into operational suicide.[10] Following from that, but rejecting Deleuze and Guattari's focus on 'microfascism' as the primary locus of fascistic circulation, this work investigates the immediacy of the pleasure of fascistic violence rather

[9] These features were not originally formalized into this exact list; rather, this synthesis is derived from numerous lectures, writings, and presentations by the author. Many of these points appeared in some form during: Johnny Golding, 'What Is Fascism?' (*Urgency of the Arts Series*, RCA, September 10, 2019).

[10] Gilles Deleuze and Félix Guattari, *A Thousand Plateaus: Capitalism and Schizophrenia*, trans. Brian Massumi (Minneapolis: University of Minnesota Press, 1987), 231.

than treating it as a byproduct of instrumentalist Reason.[11] It examines the pleasure of hate speech, conspiracy theories, and various forms of antisocial behaviour. However, this pleasure is not analysed from the perspective of an individual's psyche but as a form of cohesion within complex systems.[12]

Technological Dialectics

In that sense, this research is grounded in rejection of two popular positions. One of them argues that AI, computational infrastructures, and the pervasive algorithmisation of life extend modernity's project, grounded in the rationalist logic of Enlightenment and its dominance over other ways of knowing. This is in line with Adorno who views capitalism as part of modernity's instrumentalisation of Reason, dominating human and non-human life, ultimately fostering conditions for the rise of authoritarianism.[13] This resonates with a popular reading of *The Question Concerning Technology*, where Heidegger describes modern technology as *enframing* (*Ge-stell*), reducing the world to a *standing-reserve*—resources available solely for exploitation, which obscures deeper ways of engaging with being.[14]

This thesis critically evaluates early psychoanalytic theories of group behaviour, framing contemporary fascism as either an unleashed, repressed animalistic drive or the civilisationally constructed perversion of it that industrial capitalism has intensified.[15] This view echoes critiques of radicalisation through echo chambers and AI as a Pan-

[11] The polemic against the position that fascism aligns with the rationalist project of modernity is developed in Chapter 1, primarily referencing Adorno's *Negative Dialectics Negative Dialectics* (London: Routledge, 2004). The role of microfascism in the assemblage of Hitlerite fascism is described here: cf. Deleuze and Guattari, *A Thousand Plateaus*, 214.

[12] This is one of the original ideas developed in this thesis and is analysed in detail in Chapter 1, with all necessary references provided.

[13] Cf. Theodor W. Adorno, *Negative Dialectics*, trans. E.B. Ashton (London: Routledge, 2004),142.

[14] Cf. Martin Heidegger, *The Question Concerning Technology: And Other Essays*, Reissue edition (New York; London Toronto: Harper Perennial, 2013).

[15] That argument is developed in Chapter 1, in critical engagement with the works of both Adorno and Reich; cf. Theodor W. Adorno, "Freudian Theory and the Pattern of Fascist Propaganda" (1951), accessed October 29, 2024, https://cominsitu.wordpress.com/wp-content/uploads/2018/01/theodor-w-adorno-freudian-theory-and-the-pattern-of-fascist-propaganda-5.pdf; and Wilhelm Reich, *The Mass Psychology of Fascism*, trans. Vincent R. Carfagno, ed. Mary Higgins and Chester M. Raphael, M.D. (New York: Farrar, Straus and Giroux, 1970).

dora's box that reflects and amplifies biases, suggesting that technology accelerates irrationality and base impulses.[16] Deepfakes and AI-generated content become the symbol of the ultimate treachery of the new technological simulacra, seen to deepen the crisis of authenticity and enable a culture of 'marketplace of ideas', chaos, and sensationalism legitimised by clickbait. Here, technology bears responsibility for the relativisation of truth[17]

The aim of this research is to avoid the kind of methodological essentialism and oppositional thinking that is often resolved through **1)** the middle-groundness of liminality, **2)** the simultaneity of the two-sidedness of dialectics, **3)** hybridity, or **4)** a paradox—those premature analytical capitulations that should serve as the beginning of investigation, not as a diagnosis.[18]

To assert that the Apollonian and Dionysian, arboreal and rhizomatic, scientific and philosophical/artistic, structural and chaotic, continuous and discrete, rational and sensuous operate in opposition, neatly intertwined, or in complement is to fall into a trap of methodological essentialism.

For instance, in the context of fascism, there can be a sensuous satisfaction in feeding bodies into hyperrational algorithms of warfare, where acts of violence are executed with meticulous proportionality, adhering to the revenge logic of 'an eye for an eye

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[16] The Pandora box reference appeared across numerous, usually popular articles, cf. Veda Storey, Roman Lukyanenko, Jeffrey Parsons, and Wolfgang Maass, "Explainable AI: Opening the Black Box or Pandora's Box?" *Communications of the ACM* 65, no. 4 (2022): 1-6, https://doi.org/10.1145/3490699.

[17] This point synthesises multiple reactions to AI technologies, cf. Xinyu Wang et al., "The Reopening of Pandora's Box: Analyzing the Role of LLMs in the Evolving Battle Against AI-Generated Fake News," *arXiv*, October 25, 2024, https://doi.org/10.48550/arXiv.2410.19250; and Jiawei Zhang, "ChatGPT as the Marketplace of Ideas: Should Truth-Seeking Be the Goal of AI Content Governance?" *arXiv*, May 28, 2024, https://doi.org/10.48550/arXiv.2405.18636.

[18] This thesis engages with numerous dialectical formulations but does not undertake a full argument for rejecting hybridity and liminality. Hybridity presupposes the existence of 'pure' elements that intertwine to form something new, implicitly relying on an essentialist foundation. Liminality, while analytically similar, situates its ontology between ostensibly pure entities or misinterprets dialectics by implying that an 'excluded middle' is a position to occupy.

(but nothing more)'.[19] Historically, sadistic experimentation often functioned within a detailed instrumental register, rather than being a consequence of it.[20]

Likewise, storytelling is often presented as a community-building alternative to the cold precision of information. It can assemble an epistemic map, using anecdotal 'proofs' to generate seemingly predictive insights. Within this framework, narratives such as racist tales or urban myths about immigrants fabricate an ostensibly coherent and demonstrable a priori understanding of reality.[21]

Philosophical Image

This research posits that understanding—and the ontopolitical navigation it enables—emerges alongside or as a form of philosophical image, a cognitive construct that defies representational limits. This image is neither universal nor a priori and does not function as a synthesis, whether in the Kantian sense of combining diverse intuitions through the a priori categories of the understanding or in the Hegelian thesis-antithes-

[19] Eyal Weizman's forensic work reveals the structured logic of proportional violence but often overlooks the visceral satisfaction that such precision can evoke. This critique does not, however, stand in opposition to his work. See: Eyal Weizman, *The Least of All Possible Evils: Humanitarian Violence from Arendt to Gaza* (London: Verso, 2012).

[20] There are numerous sources that explore both curiosity-driven experimentation, which results in violation as a byproduct, and violence-driven sadistic experimentation. Tadeusz Borowski's *Here in Our Auschwitz and Other Stories*, trans. Madeline G. Levine (New Haven: Yale University Press, 2021), is a notable example of these themes. Similarly, Zofia Nałkowska's *Medallions*, a foundational post-Holocaust work, documents Nazi atrocities in Poland with chilling clarity (Zofia Nałkowska, *Medaliony*, 9th ed. [Warsaw: Czytelnik, 1965]).

[21] Andrew Jakubowicz et al., "Racist Narratives Online," in *Cyber Racism and Community Resilience: Strategies for Combating Online Race Hate*, ed. Andrew Jakubowicz et al. (Cham: Springer International Publishing, 2017), 193–215, https://doi.org/10.1007/978-3-319-64388-5_6.

is-synthesis dialectics.[22] Rather, it resonates with Deleuze's critique of the dogmatic image of thought and Prigogine and Stengers' critique of the scientific image.[23] Here, the philosophical image is not a fixed repository of meaning readily at hand; it is assembled dynamically in use, as in Wittgensteinian belief or certainty, belonging to a language game produced in the act of playing.[24] Following that, the thesis analyses synthetic thinking, assembling five original philosophical images: semi-autonomous simulacra, mood, phase slip, systemic frustration, topological phase change. Simultaneously, it attempts to determine what kind of a priori dogmatic images of thought are embedded in synthetic distributed systems.

Metaphysics

Through the detailed analysis of the logic of synthetic generation, the argument being put forward is that distributed synthetic systems, along with the discourse surrounding their emergence and proliferation, are burdened by metaphysical assumptions and various dialectical frameworks. These logics are ingrained in the architectures of AI, embedded in the design of broader synthetic infrastructures, shaping the identification of the inevitable risks of the paradigm shift, and guiding the exploration of transformative possibilities enabled by AI. Throughout the following chapters, this thesis identi-

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[22] For this stage of this argument, it is only crucial to understand that the line of thought being assembled here rejects both dialectical thinking and forms of a priori categories of understanding. See: Immanuel Kant, *Critique of Pure Reason*, trans. Norman Kemp Smith (New York: St. Martin's Press, 1929). For a full formulation of the dialectical method, see Georg Wilhelm Friedrich Hegel, *The Phenomenology of Spirit* (1807). This critique of the shortcomings of the dialectical method is indebted to Johnny Golding, best presented in 'The Courage to Matter,' in *Data Loam: Sometimes Hard, Usually Soft. The Future of Knowledge Systems*, edited by Johnny Golding, Martin Reinhart, and Mattia Paganelli (Berlin: De Gruyter, 2021)."Reinhart, Mattia Paganelli, (ed.), Data Loam: Sometimes Hard Usually Soft – The Future of Knowledge Systems (Berlin: De Gruyter, 2020), 451–486.

[23] Deleuze critiques the 'dogmatic image of thought' as an a priori framework that presumes thought's natural orientation toward truth, recognition, and clarity. Cf. Gilles Deleuze, 'The Image of Thought,' in *Difference and Repetition*, trans. Paul Patton (London: Continuum, 2008), 164–213. Similarly, Prigogine and Stengers critique the classical scientific image as deterministic and equilibrium-based, proposing instead an approach that acknowledges complexity, irreversible time, and spontaneous organization. See: Ilya Prigogine and Isabelle Stengers, *Order Out of Chaos* (New York: Bantam Books, 1984).

[24] This is further explained in Chapter 3. Ludwig Wittgenstein, *On Certainty*, edited by G. E. M. Anscombe and G. H. von Wright, translated by Denis Paul and G. E. M. Anscombe (New York: Harper & Row, 1972).

fies and critiques several philosophical attempts in addressing what Benjamin Bratton terms 'the epistemic overhang' introduced by synthetic intelligence.[25]

In line with this, this investigation highlights the failure of depth-oriented philosophies and object-oriented ontologies to adequately grasp the complexities of deep neural networks, the inability of relational frameworks to account for the strange agency of circulating digital artefacts, the limitations of structuralism in understanding meaning production within large language models, and the inadequacies of post-Platonic theories of representation in addressing the problem of 'style' and CLIP in diffusion model-based image generators.[26] Those specific examples reveal helplessness of philosophical frameworks to deal with the new distributed ontologies and planetary scale systems.

Complexity

To address these issues, in constructing a new framework of analysis through original philosophical images, the thesis turns to complexity science and non-linear dynamics. This approach acknowledges that large systems behave differently from smaller ones, or more precisely, that systems exhibit different properties at different scales, making reductive frameworks often inapplicable at planetary scales.[27] This may seem counter-intuitive when applied to synthetic architectures, given that AI systems are typically controlled, deterministic, reversible, and shielded from architectural indeterminacy.[28] However, this thesis examines the process of synthetic meaning production at scale, particularly in its articulation with a broadly understood political realm, which encompasses dimensions that are often analytically siloed—divided to the big "P" Politics, the cultural, social, economic, and technological.

By engaging with complexity theory, this research examines the temporal dynamics of complex systems, treating time as emergent in the ontological process of meaning-making. Unlike chaos theory, which explores how systems exhibit extreme sensitivity to initial conditions at the "edge of chaos"—where small variations can lead to vastly

[25] Benjamin Bratton, "After Alignment: Orienting Synthetic Intelligence Beyond Human Reflection.", 2023, https://antikythera.org/after-alignment.

[26] This is an original thought of this thesis.

[27] Klaus Mainzer, Thinking in Complexity: The Computational Dynamics of Matter, Mind, and Mankind, 5th rev. and enlarged ed. 2007 edition (Berlin; New York: Springer, 2007).

[28] Chen Chen et al., "Trustworthy, Responsible, and Safe AI: A Comprehensive Architectural Framework for AI Safety with Challenges and Mitigations" (arXiv, September 12, 2024), https://doi.org/10.48550/arXiv.2408.12935.

different outcomes—complexity theory considers this threshold as a site of ontological transformation.[29] It explores how simple deterministic processes or stochastic behaviours can generate properties that cannot be reduced to, or deduced from, the sum of the system's component properties. The key to understanding this thesis's approach to complexity is Robert Laughlin's non-reductive framework, which describes the emergence of structure, examining what it means for physical "law" to be emergent and non-universal, applying only at specific scales of matter organisation.[30]

Topological

The topological approach in this research emerges from an engagement with the libidinal philosophies of surface, the physics of topological phase transitions, and the dynamics of tensor fields, with a focus on how transformations occur without introducing external elements.[31] This work develops an original interdisciplinary understanding of topology. First, topology is addressed in its mathematical sense but reinterpreted through a political lens, focusing on how systemic properties are preserved or transformed under political shifts. This reframing moves beyond abstract geometry, linking topological invariants to structural stabilities in political systems. Second, it examines topological structures within complexity science and network theory, challenging the traditional emphasis on vertices by positing edges—representing relationships and interactions—as the primary elements that determine systemic dynamics. Finally, it reconfigures the concept of topological phase change within the framework of distributed intelligence and political dynamics.

Bestiary

Framing the thesis as a "bestiary" does not imply an exploration of othering that reduces any group to beasts or monsters. While such concerns are pertinent to discussions of fascism and are perhaps most thoroughly explored from a philosophical perspective in works, such as Jeffrey Jerome Cohen's *Monster Culture (Seven Theses)*, this

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[29] Ilya Prigogine, Isabelle Stengers, and Alvin Toffler, *Order Out of Chaos*, First Edition (Toronto: Bantam, 1984).

[30] Robert B. Laughlin, *A Different Universe: Reinventing Physics From the Bottom Down* (Basic Books, 2008).

[31] The libidinal philosophies of surface mentioned here refer to the works of Lyotard, Deleuze and Guattari, Golding to some extent, and, to a lesser degree, Klossowski. The physics of topological phase transitions will be thoroughly discussed in Chapter 3, along with the dynamics of tensor fields in Chapter 2.

thesis invokes the bestiary as a pre-Enlightenment non-reductive system of knowledge.[32] Unlike modern taxonomies preoccupied with knowing through classification by family, kingdom, or genus, bestiaries approached creatures through the symbolic religious meanings, secular 'worldview' of their time and counsel they offered.[33] This system included both mythical and real creatures—whether rare or common—without strict concern for biological or ontological classification. Instead, bestiaries provided wisdom applicable to everyday moral and spiritual decisions, offering a complex system of symbolic heuristics for navigating daily life.[34]

Therefore, in line with the title, this thesis focuses more on systems of meaning than on what defines one as a beast in the ontological sense. It explores the large-scale processes of meaning formation and transformation, alongside the dynamic relationship between what is circulated and the circulation itself. Each chapter is referred to as a 'book,' offering an immediate grasp of the shifting between a tangible object and an event of circulated content, a segment and a surface, in Deleuzian terms. The terms 'Meat,' 'Clouds,' and 'Worms' in the chapter titles do not serve as metaphors, concepts, or analogies, but function as *tensor signs*, weaving together contradictory associations and research themes, as discussed in depth in Chapter 1.[35] They serve to establish a *mood* conducive to further philosophical investigation.

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[32] Jeffrey Jerome Cohen, "'Monster Culture (Seven Theses),'" in *Classic Readings on Monster Theory*, ed. Asa Simon Mittman and Marcus Hensel (Amsterdam University Press, 2018), 61–76, doi.org/10.1017/9781942401209.006.

[33] Susan Crane, "Expanding the Bestiary's Meaning. The Case of Bodleian," in *Book of Beasts: The Bestiary in the Medieval World*, ed. Elizabeth Morrison, 1st edition (Los Angeles: J. Paul Getty Museum, 2019), 82.

[34] Caspar Henderson, *The Book of Barely Imagined Beings: A 21st Century Bestiary*, 1st edition (Chicago, Ill.: University of Chicago Press, 2013).

[35] Jean-François Lyotard, "Tensor," in *Libidinal Economy*, Reprint edition (Bloomsbury Academic, 2015).

Methodological approach

This research engages with the fabric of thinking itself in its synthetic, distributed form, emphasising the materiality of logic and rejecting the false dialectics between the scientific and the artistic, the abstract and the embodied. Consequently, its approach to so-called "practice" must uphold the same level of philosophical scrutiny and subtlety. This research rejects the binary of theory and art practice—both in their oppositional and complementary articulations—as a dangerous and misguided dialectic that assigns philosophy, and writing to some extent, a secondary role: theorising, describing, abstracting, synthesising, and modelling a chaotic, sensuous, and undecidable reality that can only be partially grasped, or worse, represented through art. Instead, this thesis positions itself within a long tradition of philosophical investigation, experimentation, and *poiesis* as *practised* by Lucretius, Husserl, Heidegger (to some extent), Gramsci, Benjamin, Klossowski, Lyotard, Deleuze and Guattari, Foucault, Nail, Sharpe, Malabou, Moten, or Golding, for whom the matter of thinking is not mere approximation or mapping.[36]

All of these philosophers have constructed not simply models, but intricate, multidimensional spaces of thought—images, objects, and epistemic architectures—that are not meant for the passive application or verification as stand-ins for the world, but to be inhabited directly, navigated materially. While it could be argued that this is precisely the function of a dynamic model, continuously refined through material feedback loops, the crucial distinction is that even the most rigorously materialist investigation operating based on the split between the reality and the model inevitably reverts to reinstalling a metaphysical structure. This structure, however subtle, obfuscates the very materiality, politics, aesthetics, and the sensuous pleasures intrinsic to the act of thinking and to thought experiments themselves.

Thus, this thesis performs a material investigation through the rigorous textual analysis of non-metaphysical, non-dialectical philosophers who foreground libidinal economies of thought, alongside materialist thinkers who partially align with these frameworks, such as Chun and Bratton, and practitioners like Nestler and Weizman. In parallel, it draws on the work of scientists and physicists—Einstein, Minkowski, Shannon,

[36] The relevant work of those thinkers is referenced throughout the body of this thesis.

Gödel, Parisi, Walker, and Agüera y Arcas, examining the far-reaching implications of their framing of space and time for the ontology of distributed intelligence.[37]

Crucially, alongside its analytical philosophical framework, this thesis introduces an original philosophical *imaginarium*—semi-autonomous simulacra, mood, phase slip, and topological phase change—approached as a material *poietic* praxis.[38] These constructs weave the impossible image of a distributed intelligent system, not as static theoretical models but as dynamic interventions in material thinking. In line with the argument of this thesis, those philosophical images are approached as emergent, and therefore possessing features that are bigger than the sum of their (intended) analytical parts. The thesis extends this argument through more conventionally understood interdisciplinary exhibition practice: sculptures, videos, installations, text pieces, and *marginalia*—sketches serving as quickly constructed experiments that support and drive the thinking process.[39]

POLYMORPH, central to this practice-led investigation, serves as a primary source for exploring emergent distributed synthetic operations that involve incompossible sensorial domains, models, signals, and types of data. As a complex adaptive system, it integrates continuously retrained AI models like Stable Diffusion and RAVE with real-time sensors, camera inputs, and various data streams. Each component—metal sheets, water tanks, conductive threads, sound resonators, cameras and speakers—acts as both input and output, creating dynamic feedback loops. Polymorph's process evolves through interaction with its environment, continuously retraining itself based on its dynamics and changing signals picked up from the environment. Its self-assembling activity exceeds conventional generative processes. In Polymorph, small shifts in air currents, body movements, and electromagnetic fluctuations shape the system's adaptive outputs. Rather than assuming a predetermined outcome, POLYMORPH re-

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[37] The relevant pieces will be references throughout the body of this thesis.

[38] This understanding stands in polemics with Aristotle, who distinguishes between the *poietic* and *praxis*. Here, however, poetics is *praxis*, resonating with Heidegger's view of *techne* in technology. It signifies skillful fabrication that marks the emergence of something new. Cf. Aristotle, *Nicomachean Ethics*, trans. W.D. Ross, in *The Basic Works of Aristotle*, ed. Richard McKeon (Chicago: University of Chicago Press, 1941), 935-1126; Martin Heidegger, *The Question Concerning Technology*, trans. William Lovitt (New York: Harper & Row, 1977), 13-35.

[39] The term "marginalia" here evokes the miniature drawings often found in the margins of illuminated manuscripts.

mains an ongoing experiment, continually generating insights into the interaction between data, signals, agents, environment, and synthetic cognition. The intricate setup of POLYMORPH is detailed in Figure 1.1, with specific components and aspects referenced throughout the thesis as needed, avoiding repetitive descriptions.

The current AI discourse frequently prioritises human-centric feedback frameworks, focusing on alignment and embedding human agency within artificial systems. A more nuanced approach, however, aligns with Lem's notion of *existential technology*.[40] Accordingly, this thesis constructs environments where artificial systems generate feedback within their intricate architectures, without extensive human mediation, as part of a practice-led exploration of emergent computational behaviours.

[40] In the context of synthetic intelligence, Benjamin Bratton interprets Stanisław Lem's work, where a distinction between instrumental and existential technologies is introduced (though in different terms). Instrumental technologies function as tool-extensions of humans, while existential technologies provoke a Copernican shift, shifting the very understanding of a knowledge paradigm. This interpretation is based on Stanisław Lem's *Summa Technologiae*, trans. Joanna Zylinska (Minneapolis: University of Minnesota Press, 2013). Bratton elaborates on this in "Cognitive Infrastructures: Synthetic Intelligence in the Wild" (London, CSM, March 7, 2024).

Summary of chapters[41]

The first chapter, *The Book of Meat: Distributed Cohesions and Attraction of Violence*, explores the material dynamics of synthetic distributed systems, focusing on the emergence of cohesive clusters of meaning that recirculate exclusionary narratives. It examines how these patterns solidify within synthetic infrastructures, emphasising the role of ontological attraction and violence in their formation.

Critiquing 20th-century theories of fascism, this chapter challenges their failure to account for large-scale dynamics, which cannot be reduced to the summation of individual psyches. It disputes explanations that root fascist violence in capitalism, bureaucracy, or patriarchal structures, arguing that these overlook the immediate, distributed, and sensuous pleasures driving collective violence, particularly in its acephalic, non-totalitarian phases.

Transitioning from Zuboff's extractivist surveillance capitalism to Sherman's *Polyoptic*on—a multi-perspectival matrix of sensing, coding, and learning, this chapter considers how forms of violence can shift and transform in contingent ways. While Zuboff's analysis accurately captures post-Cambridge Analytica assessment of anti-democratic surveillance tactics, Sherman's framework is adapted to address possible emergent fascistic circulations alongside the rise of publicly accessible AI. In this context, the notion of *phase slip* is introduced to describe moments when circulations detach from their initial contexts, reshaping systemic flows and disrupting continuity.

The discussion further examines *semi-autonomous simulacra,* digital entities that exhibit non-conscious forms of agency. These entities, such as memes that shift political alignments or data patterns acting as non-representational doubles, influence synthetic infrastructures beyond direct human intervention, evolving through viral phenomena like forum threads and community dynamics.

In addressing the rise of such agency, the chapter critiques the narrative of an AI-triggered crisis of authenticity. Instead, it reframes this as a *crisis of fabulation*, where AI hallucinations are seen not as failures but as counterfactual reconfigurations of data logics. The challenge, then, lies in moving beyond repetitive counterfactual loops to foster a more radical form of novelty that can establish new logics.

[41] This section serves as a chapter summary. For the editorial reasons, the precise, detailed references are present within the subsequent chapters.

Chapter 2. The Book of Clouds: Mood, Trauma and Synthetic Readymades extends the image of distributed ontology from Chapter 1, introducing *mood* as an emergent systemic mode that captures how constantly changing entities connect in a world where everything is already in motion. Mood is framed as a way to understand shifts in political sentiment, the persistence of oppressive dynamics, and the emergence of biassed content in AI generators, without relying on pre-existing commonalities, fixed identities, or external interventions. It is presented as the *orientedness of matter*, a form of distributed turning. Drawing on mathematical concepts like topology, n-dimensional vectors, attractors, and tensor fields, alongside acoustic and philosophical terms such as timbre, resonance, *mattering-to*, and attunement, the chapter offers a framework for understanding self-transformation within complex systems.

The chapter explores the materiality of systemic precedence, investigating how oppressive and exclusionary atmospheres endure through material investments, highlighting the lasting impact of historical traumas even amidst changing circumstances. Drawing on Sharpe's distinction between weather and climate, it differentiates mood from atmosphere, presenting atmosphere as a form of pseudo-teleological investment.

Through the analysis of pre-training in Latent Diffusion Model image generators, the chapter traces how 'bias' is not confined to flawed databases but re-emerges through seemingly innocent applied "styles." Rethinking bias as a specific form of circulation—as mood-mode—highlights the distributed systemic orientation. This approach allows for a deeper understanding of how biases persist and evolve within the generative process, rather than being mere products of initial data flaws, offering a more nuanced framework for addressing them.

Chapter 3: The Book of Worms: Recursivity, Stochasticity and Topological Phase Change formulates a framework for analysing significant systemic changes—comparable to phase transitions—focusing on paradigm shifts and political transformations, such as systems turning fascistic. Building on mood as an emergent systemic mode, this chapter explores the generative logics underlying systemic processes and the capacity of AI systems and infrastructures to create the "new" beyond recombination or embracing error.

The chapter examines how artificial systems have been falsely perceived as hyper-logical, opposed to the imperfect and organic nature of human intelligence. Chapter 3 traces the philosophical genealogy of this dialectical divide, examining contributions

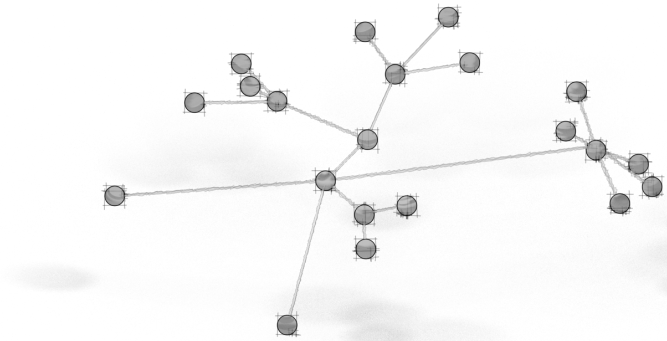
from Leibniz, early cybernetics, and Shannon's theory of information, as well as early critiques of AI like those of Hubert Dreyfus. The central argument highlights that randomness, initially viewed as a source of noise and disorder, has been repurposed in synthetic systems as a tool for managing uncertainty and complexity.

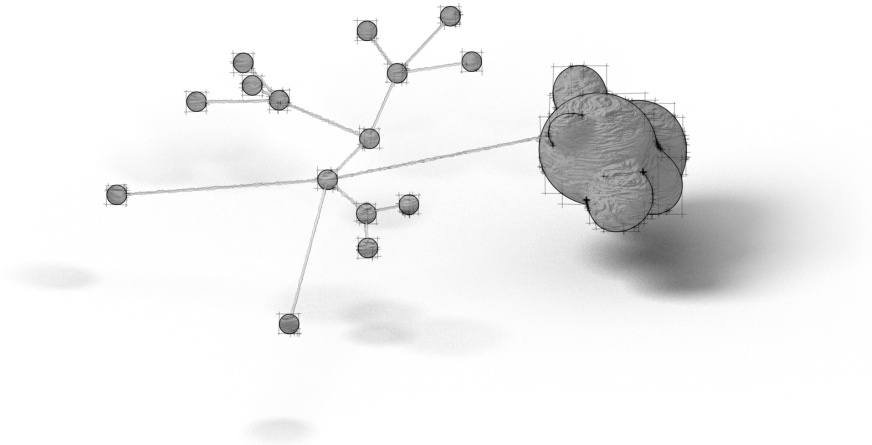
It clarifies the crucial distinction between derivative and stochastic logics, investigating the roles of randomness and uncertainty in synthetic systems. The analysis highlights the implications of these logics for emergence of novelty, questioning critiques that describe AI as merely recombinatorial or regurgitative.

Finally, it analyses phase transitions in complex adaptive systems, proposing that AI systems can undergo topological changes that restructure their internal logics while maintaining systemic coherence. Through the experiments of POLYMORPH I and II, Chapter 3 examines how AI can escape the constraints of recursive path dependencies and enable systemic plasticity.

Chapter 1

The Book of Meat: distributed cohesions and attractions of violence





The diagrams displayed throughout the thesis, culminating in Chapter 3, began as early sketches—experimental mappings that led to the development of the philosophical images of mood and semi-autonomous simulacra. These were dynamic Blender renderings, mapping systemic relationships that responded to variations in data volume across interconnected datasets and reflected the evolving relationships between them. This visual exploration prompted a rethinking of possible logics for an expanding system with self-organizing architecture.

Introduction

Chapter 1 establishes a methodology to address the transformed materiality of the political within synthetic distributed systems. It presents a systemic, topological perspective on contemporary fascist circulation, examining how meaning is generated, propagated, and intensified. The chapter identifies a gap in psychoanalytic and sociopolitical theories of fascistic circulation and addresses it by building on the libidinal philosophies of surface. This is explored in the context of the strange, distributed materiality of contemporary synthetic AI infrastructures and the role that different forms of sensuous attraction play in their emergence. By focusing on the logic of matter in large dynamic systems, the chapter distances itself from both metaphysical ontologies of meaning and representation, as well as embodied theories of intelligence.

The first section, *Sensuous stir: herd instinct, mass psychology, and father(less) unities*, critically examines 20th-century theories of fascism, particularly their failure to grasp the dynamics of large-scale systems. It challenges reductionist views that attribute fascist violence solely to the homogenising forces of capitalism, bureaucracy, or patriarchal structures.

The logic of sense and sensuous logic: production versus emergence of meaning offers a critical comparison of Golding's sensuous logic, Deleuze's logic of sense, and Deleuze and Guattari's desiring machines. This section builds on Golding's framework to establish a methodological foundation for analysing synthetic distributed infrastructures through the lens of complexity and emergence.

The third section, *Distributed attraction: accidental agency, phase slip and violence*, explores how fascist seduction and the clustering of exclusionary content operate within distributed synthetic systems. It analyses cohesions emerging across multiple, simultaneous logics, allowing for rapid shifts, cascading, and the break-off of meaning.

The final section *Crisis of fabulation: hallucinations, latent counterfactuals and authenticity*, criticises the dual narratives surrounding synthetic systems: they are mistakenly seen both as proficient confabulators, contributing to the broader crisis of authenticity, and as faithful reflections of a collective unconscious, capturing the breadth of human expression. The section presents a practice-led sculptural experiment, where data was used as material and augmented through synthetic processes, questioning the logics of data folding and representation as objective simulations.

1.1. Sensuous stir: herd instinct, mass psychology and father(less) unities

The following section does not aim to provide an exhaustive review of twentieth-century theories of fascism, a task beyond the scope of this thesis. Instead, it engages with scholars who have sought to understand fascism as a feature of the political system, rather than as a singular tragic event confined to a specific historical period.

A significant limitation in twentieth-century analyses of fascism is the failure to recognise that large-scale systems exhibit radically different properties compared to smaller ones. As a result, attempts to understand fascist social logic were often constrained by frameworks such as repressed herd instincts, civilisationally constructed identification with, or opposition to, the authoritarian father figure, or a focus on the lower middle-class family as a proto-fascist structure. This chapter argues that these interpretations are simultaneously systemically reductive—overlooking the distinct dynamics of mass systems—and excessively detailed in their dissection of family roles and the depth of psychological engagement.

In *Group Psychology and the Analysis of the Ego*, Sigmund Freud expands on his earlier work in *Totem and Taboo*, where he introduced the concept of the primal horde, led by a dominant paternal figure.[1] Freud distinguishes between herd instinct and horde instinct, arguing that humans are not naturally herd animals, which would imply cooperation and uniformity.[2] Instead, he suggests that humans are horde animals, with group cohesion dependent on a leader. Freud asserts that the herd instinct is secondary to more fundamental drives like self-preservation and the sexual instinct. The horde instinct develops through the child's desire to be the favoured figure in the parent's

[1] Sigmund Freud. *Totem and Taboo: Some Points of Agreement between the Mental Lives of Savages and Neurotics*. Translated by A. A. Brill. London: Routledge, 2001, 185.

[2] *Trotter derives the mental phenomena that are described as occurring in groups from a herd instinct ('gregariousness'), which is innate in human beings just as in other species of animals… But Trotter's exposition can be undermined psychologically… it can be made at all events probable that the herd instinct is not irreducible, that it is not primary in the same sense as the instinct of self-preservation and the sexual instinct.*
Sigmund Freud, *Group Psychology and the Analysis of the Ego*, trans. and ed. James Strachey (CreateSpace Independent Publishing Platform, 2013), 13.

eyes, but as this cannot be fulfilled, the child identifies with others, laying the foundation for group identification through infantile repression.[3]

Importantly, Freud's shifts the understanding of crowd behaviour from individual regression to the formation of a group unity, emphasising the libidinal ties centred on the leader. However, he rejects Le Bon's assertion that large social systems exhibit different properties from smaller ones.[4] Instead, he is looking for a source of collective identity — the source of unification of the individuals.[5]

Theodor Adorno, in *Freudian Theory and the Pattern of Fascist Propaganda*, revises Freud's theory of group behaviour, arguing that fascism is not a reemergence of the archaic or primitive, but rather its reproduction by modern civilization. He suggests that the herd instinct is not a natural, primary drive but a construct of socio-political forces. Members of fascist groups, Adorno claims, are aware of the fragile nature of their bond, which leads them to act with mercilessness and emotional detachment.[6] Fascist leaders redirect repressed instincts—especially aggression and libidinal drives —into obedience and devotion to the leader. The repression of personal freedom, love,

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[3] *The elder child would certainly like to put its successor jealousy aside, to keep it away from the parents, and to rob it of all its privileges; but in face of the fact that this child (like all that come later) is loved by the parents in just the same way, and in consequence of the impossibility of maintaining its hostile attitude without damaging itself, it is forced into identifying itself with the other children.*
Freud, *Group Psychology and the Analysis of the Ego*, 41.

[4] Gustave Le Bon, *The Crowd: A Study of the Popular Mind*, quoted in Sigmund Freud, *Group Psychology and the Analysis of the Ego*, trans. and ed. James Strachey (CreateSpace Independent Publishing Platform, 2013), 4.

[5] *We shall take the liberty of interrupting Le Bon's exposition with glosses of our own, and shall accordingly insert an observation at this point. If the individuals in the group are combined into a unity, there must surely be something to unite them, and this bond might be precisely the thing that is characteristic of a group.*
Freud, *Group Psychology and the Analysis of the Ego*, 4.

[6] *[F]ascism is not simply the reoccurrence of the archaic but its reproduction in and by civilization itself.*
Theodor W. Adorno, *Freudian Theory and the Pattern of Fascist Propaganda*, in The Essential Frankfurt School Reader, edited by Andrew Arato and Eike Gebhardt (New York: Continuum, 1982), 137.

and sexual desires becomes essential for sustaining authoritarian control.[7] Love, especially, is sublimated into aggressive nationalism, and any genuine expression of affection is suppressed or twisted into devotion to the state.[8] This economy of repression creates a dynamic where individuals surrender autonomy in exchange for the illusion of protection and unity under the fascist regime.[9]

Wilhelm Reich in *The Mass Psychology of Fascism* contends that it is repression, rather than any innate predatory instinct, that generates fascistic tendencies. Reich goes further, suggesting that human beings, who are otherwise naturally "cooperative and communal", are transformed into fascistic agents through systematic repression, particularly sexual repression.[10] Reich's analysis focuses on how the distortion of these otherwise communal instincts under authoritarian systems fosters a destructive, fascistic mentality.[11] The latent anxieties caused by repression are articulated in Reich's framework by the father figure of the leader, who becomes a promise of a return to security and unity but reinforces obedience, repression, and conformity.

Reich describes the authoritarian family as a fundamental cell of fascist organisation, with the father playing the role of the ultimate authority. The father teaches obedience and submission, which children later transfer to the state. Women, confined to their roles as mothers, are characterised by resignation sexually repressed to maintain patri-

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[7] *This, again, falls in line with the semblance of the leader image to an enlargement of the subject: by making the leader his ideal he loves himself, as it were, but gets rid of the stains of frustration and discontent which mar his picture of his own empirical self. This pattern of identification through idealization, the caricature of true, conscious solidarity, is, however, a collective one. It is effective in vast numbers of people with similar characterological dispositions and libidinal leanings.*
Adorno, ***Freudian Theory and the Pattern of Fascist Propaganda***, 126.

[8] *It seems significant that in today's society with its artificially integrated fascist masses, reference to love is almost completely excluded. Hitler shunned the traditional role of the loving father and replaced it entirely by the negative one of threatening authority. The concept of love was relegated to the abstract notion of Germany(...).*
Adorno, ***Freudian Theory and the Pattern of Fascist Propaganda,*** 123.

[9] Ibid.

[10] *It is this unfortunate structuralization that is responsible for the fact that every natural, social, or libidinous impulse that wants to spring into action from the biologic core has to pass through the layer of secondary perverse drives and is thereby distorted. This distortion transforms the original social nature of the natural impulses and makes it perverse, thus inhibiting every genuine expression of life.*
Wilhelm Reich, The Mass Psychology of Fascism, (Farrar, Straus and Giroux: 1933), xii.

[11] Reich, The Mass Psychology of Fascism.

archal order, resigning to their reproductive duties without autonomy. The economy enforces these roles: men as workers and soldiers, women as reproducers, and children as future loyal citizens.[12] The authoritarian family thus becomes a key mechanism through which fascist values are reproduced and societal control is maintained.

The necessity of the authoritarian Father figure in fascist movements of the 30s and 40s is clear, with the leader representing the primal father.[13] Love for the leader substitutes for love within the group, manifesting as a masochistic love of obedience. Adorno and Reich's analyses suggest the group's psychology is the sum of its members' psychology, a perspective visible in Adorno's *The Authoritarian Personality*, which outlines the socio-economic and psychological conditions for fascism.[14]

Bataille's account of fascism in *The Psychological Structure of Fascism* comes closest to grasping its articulation beyond the local scale of the individual psyche or the unification achieved through identification with the father figure. In his analysis of fascist economy, fascism operates on the tension between homogeneity (productive society) and heterogeneity (excluded groups). Homogeneous society, driven by productivity and utility, reduces individuals to their economic functions, measuring them by their value in production.[15] However, heterogeneous elements like the lower class (proletariat) and aristocracy—groups that are traditionally excluded from or oppositional to capitalist and fascist structures—are reintegrated into fascism through violence and authority.[16] Here again, the leader becomes the focal point for this reintegration, channelling both the emotional and violent energies of these heterogeneous groups. Fascism fuses these extremes under the leader's command, where individuals—aristo-

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[12] Ibid.

[13] Klaus Theweleit, *Male Fantasies*, Vol. 1, trans. Stephen Conway, Erica Carter, and Chris Turner (Minneapolis: University of Minnesota Press, 1987).

[14] Theodor Adorno and Else Frenkel-Brunswik, *The Authoritarian Personality* (Verso, 2019).

[15] *The common measure, the foundation of social homogeneity and of the activity arising from it, is money, namely the calculable equivalent of the different products of collective activity. Money serves to measure all work, and makes man a function of measurable products. According to the judgment of homogeneous society, each man is worth what he produces; in other words, he stops being an existence for itself: he is no more than a function, arranged within measurable limits, of collective production (which makes him an existence for something other than itself).*
Georges Bataille, *The Psychological Structure of Fascism*, New German Critique 16 (Winter 1979), 65.

[16] Ibid.

crats, proletarians, and others—sacrifice their autonomy, submitting to the authority of the leader who represents both unity and excess. This creates a unified yet volatile whole, driven by both repression and identification with the leader.[17]

The libidinal force in various interpretations runs through all of those attempts at grasping fascistic circulation and the specific cohesive move-force that it allows in big social aggregations. However, that libidinal force is always cohered through the psychoanalytical filter of individual psychology or, collectively, through the focal point of the paternal figure. The assumption that the father figure was indispensable for processes of identification and repression, as theorised by key 20th-century thinkers, no longer appears essential in the manifestations of 21st-century far-right and fascist movements. Many contemporary radical right-wing parties are led by women, challenging the historical reliance on patriarchal structures. Notable figures such as Marine Le Pen (*Rassemblement National*, France), Giorgia Meloni (*Fratelli d'Italia*, Italy), Pia Kjærsgaard (*Danish People's Party*, Denmark), and Alice Weidel (*Alternative for Germany*, Germany) represent a shift away from paternal or even maternal narratives in leadership despite presenting openly misogynistic narratives.[18]

In contrast, other far-right movements employ alternative strategies, such as in Poland, where the leader of the right wing party *Law and Justice* Jarosław Kaczyński, known for his lack of charisma and widespread unpopularity, avoided the role of a charismatic figurehead altogether.[19] Instead, his government relied on frequently replaced prime ministers and the manipulation of state-controlled media, gradually eroding its objectivity to maintain influence. These examples illustrate the flexibility of modern

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[17] *Considered not with regard to its external action but with regard to its source, the force of a leader is analogous to that exerted in hypnosis. The affective flow that unites him with his followers—which takes the form of a moral identification of the latter with the one they follow (and reciprocally)—is a function of the common consciousness of increasingly violent and excessive energies and powers that accumulate in the person of the leader and through him become widely available.*
Bataille, *The Psychological Structure of Fascism*, 71.

[18] Sonja Pietiläinen, "The Gender(Ed) Politics of Fascism: How Women Came to Lead the Contemporary Far-Right," Turning Point, March 20, 2024, https://turningpointmag.org/2024/03/20/the-gendered-politics-of-fascism-how-women-came-to-lead-the-contemporary-far-right/.

[19] Jan Cienski, "Poland's 'Powerholic,'" *POLITICO*, July 8, 2016, https://www.politico.eu/article/polands-powerholic-jaroslaw-kaczynski-warsaw-law-and-justice-party-pis/.

populist strategies, which do not require a traditional male figure and may instead employ different, often innovative, methods to achieve a populist turn.

In the *Prison Notebooks*, Gramsci refines the concept of the *organic intellectual* as central to his theory of political hegemony, highlighting how power is both maintained and contested.[20] He broadens the notion of leadership, steering it away from the realm of familial psychoanalysis. Unlike traditional intellectuals, organic intellectuals emerge from within their class and play a pivotal role in shaping its consciousness and political direction. This idea builds on Gramsci's development of Marx's critique of Feuerbach, where sensuous, practical activity is essential for transforming reality.[21] Rather than merely interpreting the political landscape, organic intellectuals develop strategies to change it through the organisation and mobilisation of their class. In reinterpreting Machiavelli's *The Prince* as a metaphor for the modern political party, Gramsci envisions organic intellectuals as collective guides in the political struggle, securing cultural hegemony as tools for driving social change.[22]

Golding develops the idea of Gramsci's organic intellectual revising its logic in the context of knowledge production and "the real".[23] She stresses that Gramsci's organic intellectuals must maintain an "organic link" with the fundamental social groups of history, acting as mediators between the ideological field and the practical, lived exper-

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[20] Antonio Gramsci, *Selections from the Prison Notebooks*, ed. and trans. Quintin Hoare and Geoffrey Nowell Smith (New York: International Publishers, 1971), 4, 14–15.

[21] Karl Marx, Theses on Feuerbach, in Ludwig Feuerbach and the End of Classical German Philosophy (Peking: Foreign Languages Press, 1976), 61–65.

[22] Antonio Gramsci, *Selections from the Prison Notebooks*, ed. and trans. Quintin Hoare and Geoffrey Nowell Smith (New York: International Publishers, 1971), 4, 14–15.

[23] *But despite Gramsci's immediate nod to Marx, his development of the dialectic seems to have relied on a somewhat unconventional reconstruction of the rational and real. (…) On the other hand, the 'real' embodied the concept of practical activity as expressed in the first thesis of Marx's 'Theses on Feuerbach' (i.e., the 'sensuous, objective [gegenstandliche] activity'), and, as such, contained within it intellectual activity.*
Sue Golding, *Gramsci's Democratic Theory: Contributions to a Post-Liberal Democracy* (Toronto: University of Toronto Press, 1992), 152.

ience of their class.[24] Crucially, already in this early work Golding rethinks the meaning of the philosophy of/as praxis, emphasising, after Marx and Gramsci, the significance of the "sensuous" for the 'is' (the onto-political present) of the democratic possibility.[25] In consequence, organic intellectuals and their influence should not be considered purely in the context of their rational appeal.

That sensuousness is developed further in Golding's later work and described as a logic of sense-making that does not rely on abstract, universal models. It is not fully separable from, nor does it exist in dialectical opposition to, so-called mathematical or rational logic. Instead, sensuous logic embraces the complexity and embodied experience of reality, which is "by far more elegant, confounding, mean-spirited, hilarious, erotic, and supple than any metaphysical re-presentation of it."[26] Golding positions the sensuous as central to understanding and political transformation, emphasising the material, affective, and bodily dimensions of knowledge. However, sensuous logic should not be reduced to affect, emotion, intuition, irrationality, or that which is purely sensual/sexual. Instead, it more subtly asserts that *sensing*, as performed by a localised or distributed, yet always material, body—with all its messy consequences—is an inherent part of *sense-making*. Thus, the understanding of influence, knowledge production, and circulation within any organic or synthetic system must necessarily address questions of matter, attraction, and energy, without invoking any forms of mysticism, metaphysics, or the assumption that all matter is sentient.

The framework of sensuous logic reconciles the apparent tension between transformation driven by charismatic 'organic intellectuals'—such as fascist leaders—and more acephalic, decentralised forms of political change. It offers a means of understanding how both leader-centric and leaderless movements are underpinned by a shared, em-

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[24] *For Gramsci, the specific vehicle whose necessary task would be to ensure that those conditions might come into existence (or, if existing, then be shaped and directed in a way that would maintain its organic link to the fundamental social groups) was precisely the political party, as noted earlier. But the notion of 'party' for Gramsci was not the usual vanguardist concept. It was to be understood, first and foremost, as an 'organic' intellectual (…).*
Golding, *Gramsci's Democratic Theory*, 111.

[25] Golding, *Gramsci's Democratic Theory*, xii.

[26] Johnny Golding, "Of the Thick and the Raw: Cannibalizing the 21st Century [Radical Matter: Art, Philosophy and the Wild Sciences (Untimely Meditation no. 3)]," *OAR: The Oxford Artistic and Practice Based Research Platform* 2 (2017), http://www.oarplatform.com/thick-raw-cannibalizing-21st-century/.

bodied dynamic, where the affective and material dimensions of sense-making drive collective action and transformation.

The possibility of mobilising the libidinal without involving the father figure appears briefly in both Freud and Adorno's works when they engage with McDougall's *The Group Mind*. Freud observes that, according to McDougall, "men's emotions are stirred in a group to a pitch that they seldom or never attain under other conditions".[27] McDougall attributes this heightened emotional cohesion to the phenomenon of *social contagion*, a concept that has persisted, in various theoretical forms, across disciplines concerned with group dynamics. This chapter reaches a different conclusion, arguing that, by drawing on McDougall's concept of "stirring" and Golding's notion of sensuous logic, it is precisely this *sensuous stir* that underpins the cohesive force in large-scale group formations, including those characterised by fascist dynamics.

In his other work Adorno put less emphasis on the repressed libidinal and presented fascism as a consequence of different kinds of circulation. In the *Dialectic of Enlightenment,* written with Max Horkheimer, he argues that fascism is deeply connected to the logic of modernity and the instrumental reason of Enlightenment. In their understanding the Enlightenment's emphasis on rationality and control over nature leads to domination over both nature and human beings, creating an objectified social order that stifles change. Instead of liberating humanity, Enlightenment has become a tool of oppression, deceiving the masses into adapting to the status quo while perpetuating systems of control and violence.[28]

Adorno refines that argument in *Negative Dialectics*, claiming that the dialectical production of meaning, particularly in its modernist and Hegelian forms, is itself responsible for generating violence. He claims that it is the drive for totalising unity, central to modernist reasoning or as Adorno puts it: "the insatiable identity principle perpetu-

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[27] Freud, *Group Psychology and the Analysis of the Ego*, 27.

[28] *In the service of an advancing rationalization of instrumental thought modeled on the domination of nature and serving its purposes, enlightened reason is progressively hollowed out until it reverts to the new mythology of a resurrected relationship to nature, to violence. And also: Enlightenment is as destructive as its Romantic enemies claim. It will only fulfill itself if it forswears its last complicity with them and dares to abolish the false absolute, the principle of blind power.*
Max Horkheimer and Theodor W. Adorno, *Dialectic of Enlightenment*, trans. Edmund Jephcott (Stanford: Stanford University Press, 2002), 218, 32.

ates antagonism by suppressing contradiction".[29] Adorno describes the entrapment of the dialectical negation that leaves no space for onto-epistemological exploration:

The human mind is both true and a mirage: it is true because nothing is exempt from the dominance which it has brought into pure form; it is untrue because, interlocked with dominance, it is anything but the mind it believes and claims to be.[30]

Adorno also argues that fascism emerges from the inherent logics and conditions of capitalism, functioning as an authoritarian response to the tensions, inequalities, and commodification generated by the capitalist system. Fascism, for Adorno, intensifies the domination and alienation already embedded in capitalist societies, imposing a false sense of unity. If fascism represents the culmination of late capitalism, and more broadly, the scientism, rationalism, and dialectical meaning-making of modernity, then the post-Holocaust philosophical imperative must be to resist these logics within contemporary systems of knowledge production.[31]

This conclusion, however, is rushed for at least three reasons. First, assuming that violence is a logical byproduct of certain historical thought processes is tantamount to ignoring pleasure inherent in many forms of wrongdoing. Second, it relieves the perpetrators from their agential responsibility through systemic suspension of agency. Third, it overlooks the fact that contemporary fascist turns and movements often reject intellectualism, scientific thought and academic expertise. The logics of modern fascist ideologies are not hyper-rationalist; instead, their clustering draws on sensuous associations and series.

In this context, Hannah Arendt's idea of *banality of evil* echoes the view that violence is a *consequence* or product of the systemic logic, in her interpretation, of the pre-totalitarian and totalitarian state. Arendt covered the trial of Adolf Eichmann, a Nazi officer responsible for organising the logistics of the Holocaust, as a journalist. She claimed that it was both diligence in fulfilling one's duties and a certain form of

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[29] Adorno, *Negative Dialectics*,142.

[30] Adorno, *Negative Dialectics*, 186.

[31] *A new categorical imperative has been imposed by Hitler upon unfree mankind: to arrange their thoughts and actions so that Auschwitz will not repeat itself, so that nothing similar will happen.*
Adorno, *Negative Dialectics*, 365.

"thoughtlessness" that was behind his actions.[32] In her framework, fascistic violence is a result of totalitarian systemic circulation that erodes individuality through the state's control and domination. Terror dehumanises individuals, reducing them to the mere elements of the state's machinery. They become complicit in evil without critical reflection or moral engagement. In that sense, in Arendt's vision, evil and violence are a result of bureaucratic forces, the disembodied protocols and logistics, as well as instrumental logics of circulations.

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[32] *"I also can well imagine that an authentic controversy might have arisen over the subtitle of the book; for when I speak of the banality of evil, I do so only on the strictly factual level, pointing to a phenomenon which stared one in the face at the trial. Eichmann was not Iago and not Macbeth, and nothing would have been farther from his mind than to determine with Richard III "to prove a villain." Except for an extraordinary diligence in looking out for his personal advancement, he had no motives at all. And this diligence in itself was in no way criminal; he certainly would never have murdered his superior in order to inherit his post. He merely, to put the matter colloquially, never realized what he was doing. It was precisely this lack of imagination which enabled him to sit for months on end facing a German Jew who was conducting the police interrogation, pouring out his heart to the man and explaining again and again how it was that he reached only the rank of lieutenant colonel in the S.S. and that it had not been his fault that he was not promoted. In principle he knew quite well what it was all about, and in his final statement to the court he spoke of the "revaluation of values prescribed by the [Nazi] government." He was not stupid. It was sheer thoughtlessness—something by no means identical with stupidity—that predisposed him to become one of the greatest criminals of that period. And if this is "banal" and even funny, if with the best will in the world one cannot extract any diabolical or demonic profundity from Eichmann, that is still far from calling it commonplace. It surely cannot be so common that a man facing death, and, moreover, standing beneath the gallows, should be able to think of nothing but what he has heard at funerals all his life, and that these "lofty words" should completely becloud the reality—of his own death. That such remoteness from reality and such thoughtlessness can wreak more havoc than all the evil instincts taken together which, perhaps, are inherent in man—that was, in fact, the lesson one could learn in Jerusalem."*
Hannah Arendt, *Eichmann in Jerusalem: A Report on the Banality of Evil*, Revised and Enlarged Edition (New York: Viking Press, 1964), 133–134.

Arendt was right to deny exceptionalism of the logic of Hitlerite and Stalinist's violence and see it as a consequence of pre-totalitarian imperialism.[33] She was also correct pointing out that systemic evil does not entail the necessity of moral monstrosity of the individuals or some deeply embedded psychological or essential corruption. However, similarly to Adorno, in her description of the fascistic circulation, Arendt ignored the sensuousness of violence.

In *On Violence*, Arendt distinguishes power, violence, authority and force, suggesting that power and violence are inversely related. The use of violence signals the erosion of power.[34] In terms of system dynamics, Arendt makes an important distinction: power is a collective property, while violence can be perpetuated by the few against a larger group.[35] Nonetheless, she argues that individual violence is ultimately destructive and incapable of generating or sustaining legitimate political power.[36]

The frameworks of Adorno, Arendt, and Reich, while offering critical insights into the socio-political and psychological dimensions of violence, systematically misrepresent or neglect the sensuous and affective pleasures that violence often entails. Each, from

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[33] *Imperialism, which grew out of colonialism and was caused by the incongruity of the nation-state system with the economic and industrial developments in the last third of the nineteenth century, started its politics of expansion for expansion's sake... the totalitarian claim to global rule... during this period, the nation-state system proved incapable... and ended in the disaster of totalitarianism, whose unprecedented horrors overshadowed the ominous events and the even more ominous mentality of the preceding period.*

Hannah Arendt, *The Origins of Totalitarianism* (New York: Harcourt Brace, 1973), xvii.

[34] *Power and violence are opposites; where the one rules absolutely, the other is absent. Violence appears where power is in jeopardy, but left to its own course it ends in power's disappearance. This implies that it is not correct to think of violence as a manifestation of power.*

Hannah Arendt, *On Violence* (New York: Harcourt, Brace & World, 1970), 56.

[35] *Power and violence are opposites; where the one rules absolutely, the other is absent. Violence appears where power is in jeopardy, but left to its own course, it ends in power's disappearance. This implies that it is not correct to think of political power in terms of command and obedience; power is always, as we would say today, the power of the people, whereas violence can be exercised by one or a few against all.*

Arendt, *On Violence*, 56.

[36] *The practice of violence, like all action, changes the world, but the most probable change is to a more violent world.*

Arendt, *On Violence*, 80.

Violence can destroy power; it is utterly incapable of creating it.

Arendt, *On Violence*, 56.

their respective vantage points—whether Adorno's critique of dialectical thinking and instrumental reason, Arendt's analysis of violence as symptomatic of the breakdown of political power or as a byproduct of bureaucratic logics, or Reich's and Adorno's investigation into the repressed animalistic or sexual—presents violence primarily as a systemic derivative. Yet, these approaches fail to engage with the embodied and sensuous dimensions of violence in the present. In their analyses, violence is reduced to systematically constructed frustration, a tool of control, repression, or resistance. Such an instrumentalist view, however, overlooks the intensity that violence generates. There is a visceral pleasure in the annihilation of structure, both sentient and inanimate—that arises from the act of violence itself.

This pleasure need not imply some perverse enjoyment of some total destruction of the world. In this context, this thesis proposes to rethink the banality of evil to encompass *Schadenfreude,* the joy derived from witnessing the suffering of others, and the petty satisfactions embedded in the daily infliction of harm. These include the pleasure found in acts of appropriation, indifference, scapegoating, hate speech, humiliation, mockery, derogatory jokes and various forms of othering. Those pleasures cannot be dismissed as merely peripheral but should be recognised as central to the systemic enactment of violence.

Moreover, contrary to Arendt's assertion that violence is inherently incapable of generating power, the sensuous intensity of violence, whether experienced through others' pain or one's own suffering, can create a form of addictive cohesion that becomes politically generative.[37] This section posits that large-scale violence produces an intensity that is unattainable for the individual alone. In this respect, its dynamics is based on the already discussed *'sensuous stir,'* highlighting how the collective and embodied experience of violence generates a political intensity far greater than the sum of its parts.

[37] It is this embodied, sensuous pleasure—similar to the pleasure of joy, arousal, fear, or sorrow—that constitutes violence as an event, not merely as an instrumental strategy. Therefore, the systemic analyses of the fascistic must account for the pursuit of violence not solely for its intended outcomes but for the pleasure it generates.

1.2. The logic of sense and sensuous logic: production versus emergence of meaning

> War is beautiful because it combines the gunfire, the cannonades, the cease-fire, the scents, and the stench of putrefaction into a symphony. War is beautiful because it creates new architecture, like that of the big tanks, the geometrical formation flights, the smoke spirals from burning villages, and many others…
>
> Marinetti, Futurist Manifesto

It is clear that the scope and speed of political circulation are vital for the effective dissemination of fascist ideologies. Adorno, Benjamin, and Golding argue that the rise of fascism in the twentieth century was enabled by the development of mass media.[38] Adorno associates this connection with the mass media industry's role in commodifying and homogenising cultural production. For Adorno, the emergence of the political is *mediated* through the standardised aesthetic "rhythm" that leads to homogenised unity.[39] The repetitive structures and seemingly diverse but fundamentally inflexible style of media output, according to Adorno, undermine critical thinking and foster

[38] Johnny Golding, "What Is Fascism?" (*Urgency of the Arts Series*, RCA, September 10, 2019). See also: Max Horkheimer and Theodor W. Adorno, *Dialectic of Enlightenment*, trans. Edmund Jephcott (Stanford: Stanford University Press, 2002); Walter Benjamin, *The Work of Art in the Age of Mechanical Reproduction* (1936), trans. Harry Zohn, in Illuminations, ed. Hannah Arendt (New York: Schocken Books, 1969).

[39] *Culture is infecting everything with sameness. Film, radio, and magazines form a system. Each branch of culture is unanimous within itself and all are unanimous together. Even the aesthetic manifestations of political opposites proclaim that inflexible rhythm. (…) All mass culture under monopoly is identical, and the contours of its skeleton, the conceptual armature fabricated by monopoly. The whole world is passed through the filter of the culture industry. For the present the technology of the culture industry confines itself to standardization and mass production and sacrifices what once distinguished the logic of the work from that of society. The relentless unity of the culture industry bears witness to the emergent unity of politics. The concept of a genuine style becomes transparent in the culture industry as the aesthetic equivalent of power. The culture industry, the most inflexible style of all, proves to be the goal of the very liberalism which is criticized for its lack of style.*
Horkheimer and Adorno, *Dialectic of Enlightenment*, 94–95.

passivity, effectively making people into recipients more susceptible to fascist messaging.[40]

Benjamin, in contrast, argues that the mechanical reproducibility of art through mass media enables the aestheticisation of politics, turning political engagement into spectacle. This aestheticization replaces the possibility of transformation through aesthetic expression, neutralising political agency.[41] According to Benjamin, this spectacle-driven politics can result in the glorification of violence, particularly war, which becomes an object of fascination. He references Marinetti's Futurist Manifesto, where war is celebrated as "beautiful" and a force for political and formal renewal, demonstrating how destructive acts can be framed as regenerative through their aestheticised presentation.[42]

According to Golding, the relationship between fascist logic and the rise of mass media highlights a systemic implication: the massification of information, and their rapid dissemination through political systems that, in their early stages, democratically choose to orient towards fascism. Fascist rule is rarely the result of an immediate, top-down dictatorial imposition; rather, fascist parties often ascend to power through democratic

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[40] *Fascism, however, hopes to use the training the culture industry has given these recipients of gifts, in order to organise them into its own forced battalions.*
Horkheimer and Adorno, *Dialectic of Enlightenment*, 131.

[41] *Fascism attempts to organize the newly created proletarian masses without affecting the property structure which the masses strive to eliminate. Fascism sees its salvation in giving these masses not their right, but instead a chance to express themselves. The masses have a right to change property relations; Fascism seeks to give them an expression while preserving property.*
Walter Benjamin, *The Work of Art in the Age of Mechanical Reproduction* (1936), trans. Harry Zohn, in Illuminations, ed. Hannah Arendt (New York: Schocken Books, 1969), 241.

[42] *Fiat ars – pereat mundus", says Fascism, and, as Marinetti admits, expects war to supply the artistic gratification of a sense perception that has been changed by technology. This is evidently the consummation of "l'art pour l'art." Mankind, which in Homer's time was an object of contemplation for the Olympian gods, now is one for itself. Its self-alienation has reached such a degree that it can experience its own destruction as an aesthetic pleasure of the first order. This is the situation of politics which Fascism is rendering aesthetic. Communism responds by politicizing art.*
Walter Benjamin, *The Work of Art in the Age of Mechanical Reproduction*, 243.

processes. In this regard, fascism constitutes a particular form of systemic pathology that enables the system to turn against itself.[43]

It is important to resist medical metaphors of pathology in this context and, instead, examine the logic of fascist dissemination. Moreover, it is critical to observe how contemporary fascism differs from twentieth-century forms of totalitarian propaganda enabled by mass media. These differences are not simply technological advancements in the dissemination of information, but reflect significant shifts in the modes of circulation, representing a fundamental change in fascistic flows, rather than just in the media through which they spread. Golding suggests that it is "circulation (dissemination and proliferation) of information as 'collective assemblages' – the recognition of patterns and their repeatability in whole or in part" that can be "re-assembled with parts added or missing".[44]

Others add that those algorithmic technologies and assemblages, despite actively shaping contemporary realities, are misrepresented as disembodied entities, inhabiting an abstract computational realm of virtuality.[45] While this critique is valid, counter arguments often focus on their tangible environmental impact, emphasising their status as power-hungry, resource-intensive industries reliant on concealed, low-wage labour for tasks such as data labelling, model training, and content moderation.[46] However, such critiques, while necessary, tend to sidestep onto-epistemological inquiries into the materiality of algorithmic spaces, objects, events, and time. This leads to either a focus on

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[43] Hannah Arendt argues that totalitarian regimes, including fascist movements, often rose to power by manipulating democratic systems and using legal mechanisms to establish themselves before dismantling those same systems. See Hannah Arendt, *The Origins of Totalitarianism* (New York: Harcourt, 1951), 306-310. Ian Kershaw similarly illustrates how Adolf Hitler's rise was made possible through democratic processes and political maneuvering. See Ian Kershaw, *Hitler: A Biography* (New York: W. W. Norton & Company, 2008), 384-390. Robert Paxton further explores how fascist movements exploited existing political structures to gain legitimacy before undermining them from within. See Robert Paxton, *The Anatomy of Fascism* (New York: Alfred A. Knopf, 2004), 120-130.

[44] Johnny Golding, 'The Courage to Matter', Data Loam: Sometimes Hard, Usually Soft (the Future of Knowledge Systems), 2021. https://doi.org/10.1515/9783110697841.

[45] As noted by: Luciana Parisi, Contagious Architecture: Computation, Aesthetics, and Space. Cambridge, MA: MIT Press, 2013.

[46] Kate Crawford, *Atlas of AI: Power, Politics, and the Planetary Costs of Artificial Intelligence.* New Haven: Yale University Press, 2021.

the politics of the physical infrastructures of AI systems or, as Matteo Pasquinelli argues, the claim that AI coding structures imitate the intelligence of labour and social relations, where labour as logic is reflected in code.[47]

This chapter proposes that Golding's sensuous logic can be used to understand contemporary fascist circulation in the context of synthetic intelligence, the role of aesthetics in political dissemination, and the influence of the libidinal in shaping political dynamics.

The history of the development of artificial intelligence reflects the enduring struggle to comprehend both the mechanisms of intelligence and the materiality of computation, as visible in the tensions between symbolic AI, embodied AI, and stochastic approaches. Symbolic AI, central to early synthetic systems, conceptualised intelligence as an abstract process of manipulating symbols within a computational space.[48] It assumed that it is possible to store a model of the world in a computer to make the synthetic intelligence successfully navigate it. In contrast, embodied AI emphasised cognition's grounding in embodied sensorimotor interactions with the environment. It assumed that the world is the best model of itself, and therefore it is only through embracing of that deep entanglement with it that intelligence can emerge.[49] The stochastic approach, which rose to prominence with machine learning, focuses on feedback loops, adaptation, and randomness with intelligent systems learning iteratively through data and statistical methods. While Chapter 3 will unpack these logics in detail, the critical point here is that the most successful synthetic intelligences, such as connectionist AI (relying on the stochastic approach), are neither purely abstract blueprints of

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[47] *That the inner code of AI is constituted not by the imitation of biological intelligence but by the intelligence of labour and social relations.Today, it should be evident that AI is a project to capture the knowledge expressed through individual and collective behaviours and encode it into algorithmic models to automate the most diverse tasks: from image recognition and object manipulation to language translation and decision-making.As in a typical effect of ideology, the 'solution' to the enigma of AI is in front of our eyes, but nobody can see it–nor does anybody want to. (...) ultimately, all labour is logic.*
Cf. Matteo Pasquinelli, *The Eye of the Master: A Social History of Artificial Intelligence* (London: Verso, 2023), 2–3.

[48] Md Kamruzzaman Saker, Lu Zhou, Aaron Eberhart, and Pascal Hitzler, *Neuro-Symbolic Artificial Intelligence: Current Trends*, Department of Computer Science, Kansas State University, 2021, https://arxiv.org/abs/2105.05330v2.

[49] Hubert L. Dreyfus, *Why Heideggerian AI Failed and How Fixing It Would Require Making It More Heideggerian*, Artificial Intelligence 171, no. 7 (2007): 1137–1160, https://doi.org/10.1016/j.artint.2007.10.012.

reasoning operating based on fixed formulas, nor purely embodied structures learning from interactions in the world, nor a mere hybrid of these approaches. This constitutes the foundational orientation of the materialism that this thesis both addresses and attempts to assemble.

Building on these distinctions, Golding's sensuousness does not position the body, individual experience or emotion, whether individual or collective, as a logical a priori or the fundamental source of intelligence. Overemphasizing embodiment and bodily-mediated thinking risks collapsing into a reductive dialectic between the abstract and the physical, similar to the metaphysical divide between software and hardware. Intelligence is not determined by embodiment alone but emerges from the dynamic interplay between sensing and sense-making. Sensing extends beyond recursion, it is the plural moment of being in the world and not ever being extractable from it. Sense-making, in turn, manifests as non-local cohesion, a form of circulation that is not linear but rather an emergent logic—a pattern that coheres meaningfully.

Similarly to Golding's sensuousness, Deleuze and Guattari describe the sexual as a material logic that transcends individual or collective bodies, operating as a cross-systemic force that shapes the political.[50] They frame this force as desire, or the flow of desire, which, in contrast to Lacan's notion of lack, functions as an affirmative, generative power—continuously assembling, transforming, dismantling, and destroying. This affirmative force is a development of Spinoza's *conatus*, understood as the inherent drive of beings to persevere — *conatus sese conservandi*, and the joy that naturally arises from this striving.[51]

In *A Thousand Plateaus*, Deleuze and Guattari borrow also Spinozian conception of *affectio* and *affectus*, reconceptualising affect as a *pre-subjective* intensity—a capacity of matter to affect and be affected. In that sense, affect operates as a fundamental dynamic force of connection-attraction perpetually bringing together objects, events, space

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[50] This is visible across the entire body of work of Deleuze and Guattari. This chapter will mostly reference Gilles Deleuze and Félix Guattari, *A Thousand Plateaus: Capitaliism and Schizophrenia* (London: Bloomsbury Academic, 2013).

[51] *The striving to preserve oneself is the first and only foundation of virtue. Happiness consists in man's ability to preserve his own being.* (Conatus sese conservandi prima et unica virtutis est fundamentum. Beatitudo in eo consistit, quod homo suum esse conservare potest.)
Baruch Spinoza, *Ethics*, trans. Edwin Curley (London: Penguin, 1996), Part IV, Proposition 18.

and time. As a consequence, it creates multistable assemblages and transformations that exceed rigid, predetermined boundaries and hierarchies of meaning.[52] The meaning and consequence of this multistability is that the affective flow is not some undifferentiated flux, but at the same time the created intensities of meaning are never permanent, static or universal.[53] Crucially, Deleuze and Guattari's framework resists the metaphysical split between the body and the meaning, while simultaneously acknowledging that materiality is not confined to physical embodiment nor is it reducible to its corporeal substrate. Instead, the affective flow brings elements together into relations and series. Affect operates as a force of *becoming*, continuously reconfiguring the capacities of bodies and elements to act and be acted upon, as well as creating new affections. In that way, it produces systemic difference introducing new attractions and slippages of meaning, preventing static belongings. *Becoming* in that understanding is not directed towards a pre-established purpose — it is not "becoming something", nor is it an intermediary process leading to a final state. Rather, it points to movement, multiplicity and openness as fundamental features of meaning.[54]

A Thousand Plateaus develops Deleuze's work from *The Logic of Sense*, where he describes a *series* as a collection of ontologically heterogeneous elements, connected through resonance, difference, and divergence.[55] Series are configurations not linked

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[52] Spinozian affect remains tied to a body. See: Baruch Spinoza, *Ethics*, trans. Edwin Curley (London: Penguin, 1996), Part III, Prop. 9 Scholium. Cf.

> *An assemblage, in its multiplicity, necessarily acts on semiotic flows, material flows, and social flows simultaneously. Affects are precisely these nonhuman becomings of man, just as percepts—including the town—are nonhuman landscapes of nature. Affects are projective and creative events. [...] Affect is not a personal feeling, but an effectuation of power on bodies, a real transformation.*

Gilles Deleuze and Félix Guattari, ***What is Philosophy?***, trans. Hugh Tomlinson and Graham Burchell (New York: Columbia University Press, 1994), 169.

[53] Multistability is when a system can settle into multiple different stable states. This is developed in Chapter 3.

[54] *A becoming is not a correspondence between relations. But neither is it a resemblance, an imitation, or, at the limit, an identification. Becoming produces nothing other than itself. It is a verb with a consistency all its own; it does not reduce to, or lead back to, 'appearing,' 'being,' 'equalling,' or 'producing.'*

Gilles Deleuze and Félix Guattari, *A Thousand Plateaus: Capitalism and Schizophrenia*, trans. Brian Massumi (Minneapolis: University of Minnesota Press, 1987), 238.

[55] Gilles Deleuze, 'The Sixth Series on Serialization', *The Logic of Sense*, trans. Mark Lester with Charles Stivale, ed. Constantin V. Boundas (New York: Columbia University Press, 1990).

through resemblance or linear continuity but through a "disjunctive synthesis," which generates sense from the interaction of divergent elements. These series are not organised in depth but on the surface, where differences resonate with one another.[56] The notion of return, drawn from Nietzsche's eternal return, is crucial to understanding the dynamics at play in Deleuze's treatment of series and meaning. The tension and continuity of the Deleuzian surface is maintained through the logic of return. Deleuze reinterprets Nietzche's work as the return of difference, rather than a reassertion of sameness. It does not reaffirm a prior state but intensifies the disjunction between divergent series. Meaning, in this sense, is produced on/within the surface, where differences resonate through disjunctive synthesis. The eternal return complicates any fixed resemblance or identity, emphasising a dynamic process of divergence and the continuous generation of meaning through difference.[57] This is crucial for the understanding of the "sense" side of sensuousness, or, in this case, the logical proposition implied by the *flow of desire* that describes sense *produced* across various ontological codes.[58]

Both Golding and Deleuze reject metaphysical and dialectical structures as well as the intermediary role of representational or symbolic systems in the emergence of meaning. Both of those frameworks assume that meaning is material, happening in the present and not summoned from the depth of unconsciousness. However, the distinction between Golding's sensuous logic and the work of Deleuze and Guattari, or Deleuze's logic of sense, lies in their treatment of the immediacy of meaning. In Golding's framework the meaning is emergent, in Deleuze and Guattari's work, the meaning emerges from complex production of desiring machines.[59] That distinction is not

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[56] Gilles Deleuze, 'The Sixth Series on Serialization', *The Logic of Sense*, 69,115.

[57] Gilles Deleuze, *The Logic of Sense*, trans. Mark Lester with Charles Stivale, ed. Constantin V. Boundas (New York: Columbia University Press, 1990), 253-265.

[58] Gilles Deleuze and Félix Guattari, *Anti-Oedipus: Capitalism and Schizophrenia*, trans. Robert Hurley, Mark Seem, and Helen R. Lane (New York: Viking Press, 1977).

[59] The following paragraph develops that comparison based on the entire body of work of Johnny Golding and Deleuze and Guattari. However, for this particular thought, it draws specifically on Johnny Golding's *The Courage to Matter* in *Data Loam: Sometimes Hard, Usually Soft. The Future of Knowledge Systems*, edited by Johnny Golding, Martin Reinhart, and Mattia Paganelli (Berlin: De Gruyter, 2021), and Deleuze and Guattari's *Anti-Oedipus: Capitalism and Schizophrenia*.

purely linguistic. In Deleuze and Guattari's work meaning emerges *from* the relations, differences, and tensions between elements — it is as they call it "a fabric of immanent relations". In Golding's work, however, emergence includes *a leap of logic* in line with complexity science — it insists that the emergent *assemblage*, to borrow from D&G, displays properties that are not a direct consequence or a sum of the elements and properties that come together to create that distributed belonging. Rather than relativising the boundaries of bodies and focusing on cross-systemic forces and cohesions, Golding's framework **1)** allows for events that cannot be deduced from the systemic priors, and **2)** acknowledges radical systemic shifts/new features that emerge at scale in large complex systems (emergent structure). This form of emergence is immediate, not assembled.[60]

That difference becomes apparent with the analysis of fascistic attractions. Deleuze and Guattari notice that "fascism is desire" rather than some form of masochist longing of the masses to be repressed, undifferentiated instinctual flow or people being tricked by false seduction of fascist ideology.[61] Instead, they suggest that fascism in its working is linked to molecular or micropolitical power rather than overpowering totalitarian flow. They claim that fascist in its logic is "cancerous" — it is tied to the "microformations already shaping postures, attitudes, perceptions, expectations, semiotic systems, etc.".[62] In that sense, fascism is molecular, it is both: the fine segmentations of microfascisms happening regardless of political orientation: "molecular focal points; band, gang, sect, family, town, neighborhood, vehicle fascisms spare no one" and the fascist flow that disrupts the coding of formalised interactions.[63]

In Deleuze and Guattari's understanding, fascism is embedded in the molar-molecular dynamic, but its true danger lies in molecular power. This duality should not be seen

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[60] This is not to imply that Deleuze and Guattari's logic is causal or linear; it is crucial to emphasise that their framework is neither. This section continues to draw on Golding's "The Courage to Matter".

[61] Deleuze and Guattari, *A Thousand Plateaus*, 165.

[62] *Desire is never separable from complex assemblages that necessarily tie into molecular levels, from microforma-tions already shaping postures, attitudes, perceptions, expectations, semiotic systems, etc. Desire is never an undifferentiated instinctual energy, but itself results from a highly developed, engineered setup rich in interactions: a whole supple segmentarity that processes molecular energies and potentially gives desire a fascist determination.*
Deleuze and Guattari, *A Thousand Plateaus*, 215.

[63] Ibid.

as a matter of scale—molar as global or State-related and molecular as local. Instead, the molar refers to rigid forms of segmentation, such as class divisions or institutional regulations, while the molecular signifies a "mutant quantum flow" that dissolves clear boundaries between individuals and collectives, rendering them irrelevant as distinct, quantified entities.[64]

Deleuze and Guattari agree with Virilio that fascism differs from totalitarianism because of its paradoxical and suicidal nature.[65] In that sense, it does not just attempt to control desire through imposition of a rigid, totalitarian structure, eradication of difference and closing of a system. Rather, it emerges when the molecular flows of desire start resonating with the war machine rather than the State apparatus.[66] The war machine, originating from the nomadic societies, is a destructive deterritorialising force that does not have a war as its object. Rather it is a force of creative mutation or a line of flight.[67] Fascism as an assemblage amplifies that destructive desire, including the

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[64] The "mutant quantum flow" refers to particle-wave duality. Deleuze and Guattari draw on quantum indeterminacy, where particles exhibit both particle-like and wave-like behaviour, aligning with their views on segmentarity and on flows and planes (which in their vocabulary are distinct). This is addressed in this chapter.

Deleuze and Guattari, *A Thousand Plateaus, 230.*

[65] *Paul Virilio's analysis strikes us as entirely correct in defining fascism not by the notion of the totalitarian State but by the notion of the suicidal State: so-called total war seems less a State undertaking than an undertaking of a war machine that appropriates the State and channels into it a flow of absolute war whose only possible outcome is the suicide of the State itself.*

Deleuze and Guattari, *A Thousand Plateaus*, 231.

[66] *It was this reversion of the line of flight into a line of destruction that already animated the molecular focuses of fascism, and made them interact in a war machine instead of resonating in a State apparatus. A war machine that no longer had anything but war as its object and would rather annihilate its own servants than stop the destruction. All the dangers of the other lines pale by comparison.*

Ibid.

[67] *We are not invoking any kind of death drive. There are no internal drives in desire, only assemblages. Desire is always assembled; it is what the assemblage determines it to be. The assemblage that draws lines of flight is on the same level as they are, and is of the war machine type. Mutations spring from this machine, which in no way has war as its object, but rather the emission of quanta of deterritorialization, the passage of mutant flows (in this sense, every creation is brought about by a war machine). There are many reasons to believe that the war machine is of a different origin, is a different assemblage, than the State apparatus. It is of nomadic origin and is directed against the State apparatus.*

Deleuze and Guattari, *A Thousand Plateaus*, 229.

desire for annihilation and abolition. Fascism paradoxically thrives on this self-destructive energy, appealing to the masses' desire for both domination and death.[68] This is why Deleuze and Guattari describe fascism as a form of "realised nihilism"—it leads to its own end rather than the preservation of state power.[69]

The turning of the entire system into a fascist system is a question of a complex economy of *production of various desiring machines* and collective resonance between the systemic parts but in D&G understanding, it lacks a definite qualitative or quantitative threshold:

> "(…) every fascism is defined by a micro-black hole that stands on its own and communicates with the others, before resonating in a great, generalized central black hole."[70]

One could argue that that 'production' should not be taken literally or in a linear manner and the entirety of that libidinal economy: segmentations, assemblages, flows, intensities happens immediately within a single surface— the plane of immanence, developed from Spinozian immanence, which assumes the world as one *causa sui* substance.

> "By substance, I understand that which is in itself and is conceived through itself; that is, that whose concept does not require the concept of another thing, from which it must be formed."[71]

However, simultaneity is rarely emphasised in Deleuze and Guattari's work. At points, they draw inspiration from quantum theory's wave-particle duality, for example when

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[68] Crucially, that death is not some kind of psychoanalytical death drive because that would assume some internal motivation to desire, contradictory to Delezue and Guattari's philosophy.

[69] *Fascism is constructed on an intense line of flight, which it transforms into a line of pure destruction and abolition. It is curious that from the very beginning the Nazis announced to Germany what they were bringing: at once wedding bells and death, including their own death, and the death of the Germans. They thought they would perish but that their undertaking would be resumed, all across Europe, all over the world, throughout the solar system. And the people cheered, not because they did not understand, but because they wanted that death through the death of others.*
Deleuze and Guattari, *A Thousand Plateaus*, 230.

[70] Deleuze and Guattari, *A Thousand Plateaus*, 229.

[71] Baruch Spinoza, *Ethics*, trans. Edwin Curley (London: Penguin Books, 1996), Part I, Def. III.

describing 'mutant flows', yet their incompossible series of meaning still require a 'disjunctive synthesis' to bring cohesion to divergent elements (series).[72]

In contrast, Golding's framework surpasses the ontological *oscillation* as production between segmentation and plane, or the distinction between things and flows of matter, with her expanded immediacy of meaning. Golding focuses on the very assembling of the assemblage — the very moment/space — spacetime of "stickiness" of being and meaning. Building on the Heideggerian identity principle and "event of appropriation", Golding proposes to read his *A=A* as an encounter of embodied exchange,

[72] That difference between emergent and produced meaning can be observed based on Deleuze and Guattari distinguishing between two ontological planes: the plane of development-organisation and the plane of consistency from *A Thousand Plateaus*. The Plane of Organisation or Development (Transcendent Plane) gives the world its familiar contours, "makes visible what is seen and audible what is heard." It is both structural and genetic, shaping reality's recognizable forms and subjects. Yet, this plane is never directly given—it refers to a hidden principle that organises forms and subjects in a teleological manner, operating in an auxiliary dimension to what it produces: "to which it gives rise (n + 1)." In contrast, the Plane of Consistency or Composition (Immanent Plane) is devoid of structure and, crucially, of genesis: "there is no structure, any more than there is genesis." It consists of relations of "movement and rest, speed and slowness between unformed elements." This plane is one of non-consistency and non-contradiction, characterised by the exponential proliferation of elements and dimensions without evolutionary development. Instead of forming stable entities, it involves *involution*, where forms dissolve and transform (but are not annihilated). These two planes are in opposition and engaged in a dynamic, often violent interplay.

The persistent rejection of hierarchy and structure within Deleuze and Guattari's thought paradoxically reinstates dialectical dynamics at key points. The tension between the structuring forces and the immanent plane of involution obstructs any attempt to grasp immediate material meaning or its circulation. Even if these two planes are not regarded as equivalent, with the plane of immanence representing the primary plurality of all meaning, structure and boundary operate within a separate analytical register. The same mechanism repeats with territorialisation-deterritorialization, molar-molecular, stratification-smoothness (striated-smooth), major-minor, decoding-recoding, virtual-actual, rhythm and the flow. Each of these dynamics is subsequently vivisected to reveal that they are not fully dialectical, especially when these forces, strategies, or ontological planes are applied to political phenomena. However, the way they function as immediate images of thought often inscribes them within a sophisticated but dialectical framework. The key difference is that now the emergence of meaning seems to result from the movement of these dialectical fabrics where the forces are interwoven, rather than facing-confronting each other as in Hegelian dialectics.

where the ontological base of all being is always already plural.[73] That seemingly tautological equation marks a principle of being that is always already in the world, a belonging that collapses the rigid divisions between subjects, objects, and contexts.[74] That being-together-apart, (Zusammengehörigkeit) as Heidegger puts it, gets rid of transcendence but, as Lyotard also rightly points out, it excludes the *Other* by establishing identity through a self-referential, self-contained logic that denies any difference.[75] In Golding's reading, following Lyotard's critique, $A = A$ becomes a form of sensuous attraction and circulation that includes difference. This is achieved through a rethinking of the "=" sign and a surface-plane. To envision the stickiness of meaning and the emergence of differentiated structures from the event of attraction, the surface is denoted as zero (o), which does not imply lack or absence. That surface, following Heidegger, is already plural, $o = o$, where the "=" can be marked as a segment 1, such that $1 = (o = o)$. As attractions proliferate, this map of cohesions expands, and can be expressed as $(o = o) = 1 + o + 1 + o\ldots$, extending infinitely.[76] Deleuze and Guattari's fabric of immanent relations in Golding's work is a differentiated fabric of emergent attractions.

This version of a surface does not require the production of meaning through assemblage but demonstrates its formation through ontological attraction. Crucially, making attraction/circulation "=", the logically first ontological moment allows for the immediacy of meaning and matter. This immediacy is essential for understanding the distribution of contemporary synthetic systems, whose 'bodies,' operations, and cohesions are becoming more planetary and encompass radically different forms of matter.

In that sense, it could be understood through Robert Laughlin's hierarchical theory of matter and emergence that presents an image of complexity as graspable only *across* multiple scales, "where each level has its own rules and behaviours". Emergent phenomena happen at each scale, creating symmetries that are not a sum of constituent elements and interactions. That redefines the notions of fundamentality, symmetry

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[73] Martin Heidegger, *Identity and Difference*, trans. Joan Stambaugh, 2nd ed. Edition, Chicago: University of Chicago Press, 2002.

[74] Johnny Golding, 'The Courage to Matter', Data Loam: Sometimes Hard, Usually Soft (the Future of Knowledge Systems), 2021. https://doi.org/10.1515/9783110697841.

[75] Jean-François Lyotard, *Heidegger and "the Jews"* (Minneapolis: University of Minnesota Press, 1990).

[76] Golding, 'The Courage to Matter'.

and a phase.[77] Fundamentality is no longer linked to the lower level phenomena — smallest possible ontological elements. Rather, the fundamental is that which cannot be explained through the sum of its components — an emergent symmetry — an emergent edge. A phase, then, could be seen as the emergent state of the system, where the collective behaviour reorganises beyond a critical threshold in the scale-dependent dynamics.[78]

This realisation was tested in POLYMORPH I's experimental logic, where the system operated within a framework of attractions and transformations across varied sensory and coding "domains." Multivariate thresholds and the complex systemic structure enabled each element to function as both input and output interchangeably, leading the system to exhibit different behavioural 'phases' that, to some extent, self-assembled through the system's own body. Their distinct rhythms were not a direct consequence of any design decisions — they emerged through the dynamics flows of data within the system.

This attraction-oriented formulation of matter and meaning carries profound implications for understanding the political and the strange cohesions stretching across bodies of data, latent space tokens, layers of interconnected artificial neurons, sensor-imbued objects and implants, 'smart' infrastructures, blockchain currencies, augmented realities, neural interfaces, avatars, chatbots, lab-designed cells and organisms, and a plethora of other material entities that can no longer be, and perhaps never should have been, confined to the 'virtual' or artificial world.

Golding and Laughlin's work provides a rigorous framework for understanding the structures of reality, specifically the radical simultaneity of its multiple logics and the hierarchies they establish. In their conception of reality, contradictory laws can coexist without necessarily being paradoxical. Their insights enable a deeper comprehension of new materialities and the relationships these materialities form with pre-existing infrastructures. Furthermore, their approach challenges the notion of emergence as a purely spontaneous or unexpected event, instead framing it as a structuring process— one that does not, however, lead to the creation of totalities or universal truths. The early signs of those logics can be observed and tested already in the fairly rudimentary

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[77] Laughlin, *A Different Universe: Reinventing Physics from the Bottom Down* (New York, NY: Basic Books, 2006).

[78] This is an original thought based on the analysis of Golding's work.

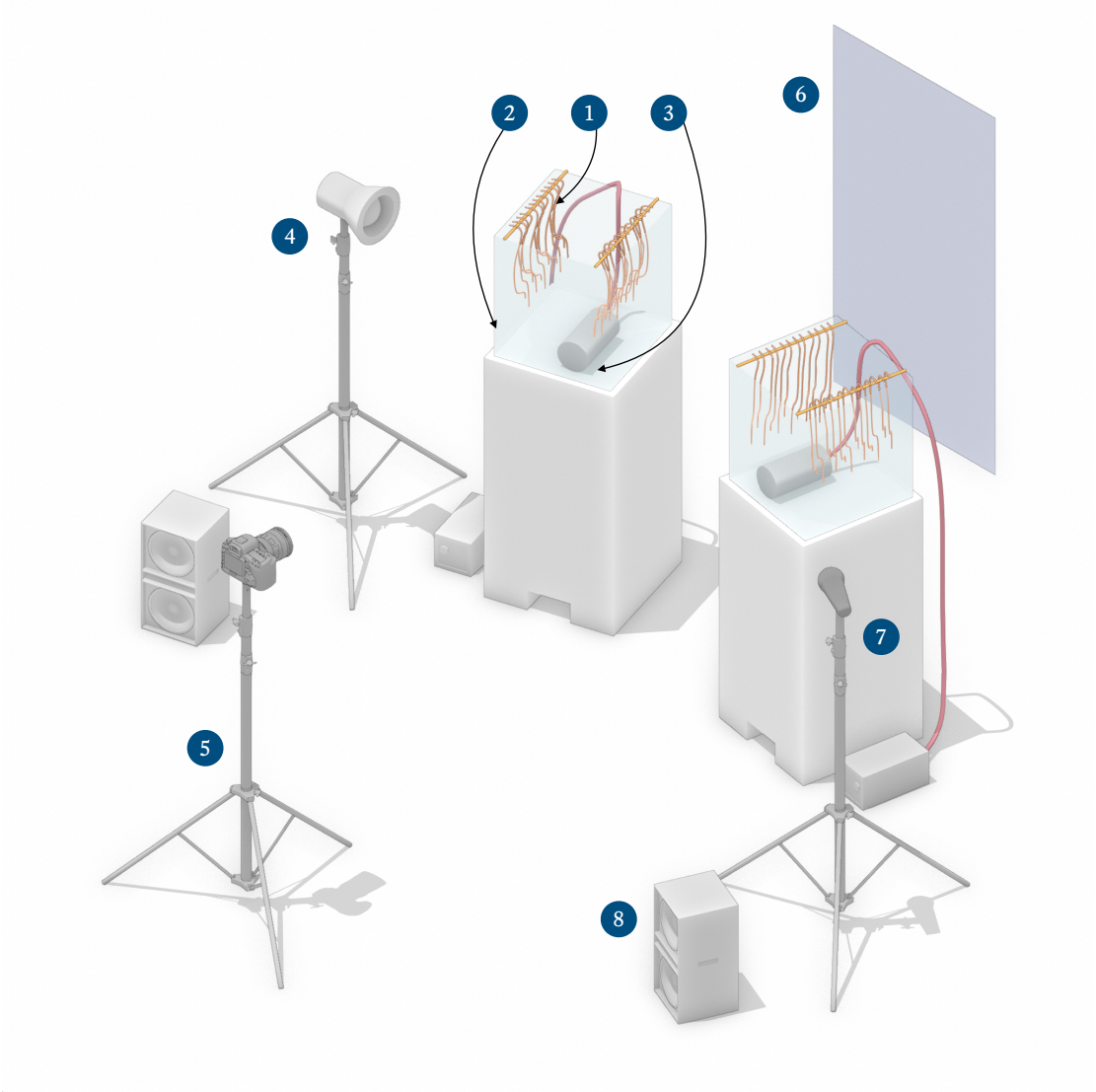

FIGURE 1.1: Experiment and exhibition design for POLYMORPH I.

2 rows of conductive steel hair **(1)** in each tank **(2)** react to the movement of water. Those waving proximities produce variable data that gets fed into *TouchDesigner*. The topology of the system becomes the mapped 'surface' of that waving. Water pumps **(3)** placed in each tank are triggered by the changes of light in the room affecting water motion. A reflector **(4)**, triggered by TD casts light over the tanks producing dynamic light patterns that are captured by the camera **(5)** and fed back into the system. A *Stable Diffusion* model trained on octopus skin transformations and light patterns is embedded in the *TouchDesigner* setup. Images of patterned topologies react to the changing behaviour of the system. They are dynamically generated and projected onto the canvas **(6)**. Their shape, pulsation and behaviour is a result of the changing conditions of the system. A microphone **(7)** picks up sound from the speakers, water tanks and a projector. RAVE model generates sound based on the varying systemic input. The sound is played through the speakers **(8)**.

but complex multi-sensory systems imbued with sensors and generative models as tested through Polymorph 1.

Polymorph 1, 2023

Figure 1.2: Exhibition view and detail shot of Polymorph 1.

Polymorph 1 is an early prototype of a generative complex system that, in later iterations, continuously collects data to retrain its model. Each element within the system can function interchangeably as both input and output. This distributed internal data is then used as prompts to generate subsequent images and sounds. A key aspect was ensuring the system's responsiveness to physical processes such as heat, vibration, movement, and electric current.

A video record of the experiment is available at: https://vimeo.com/887009697

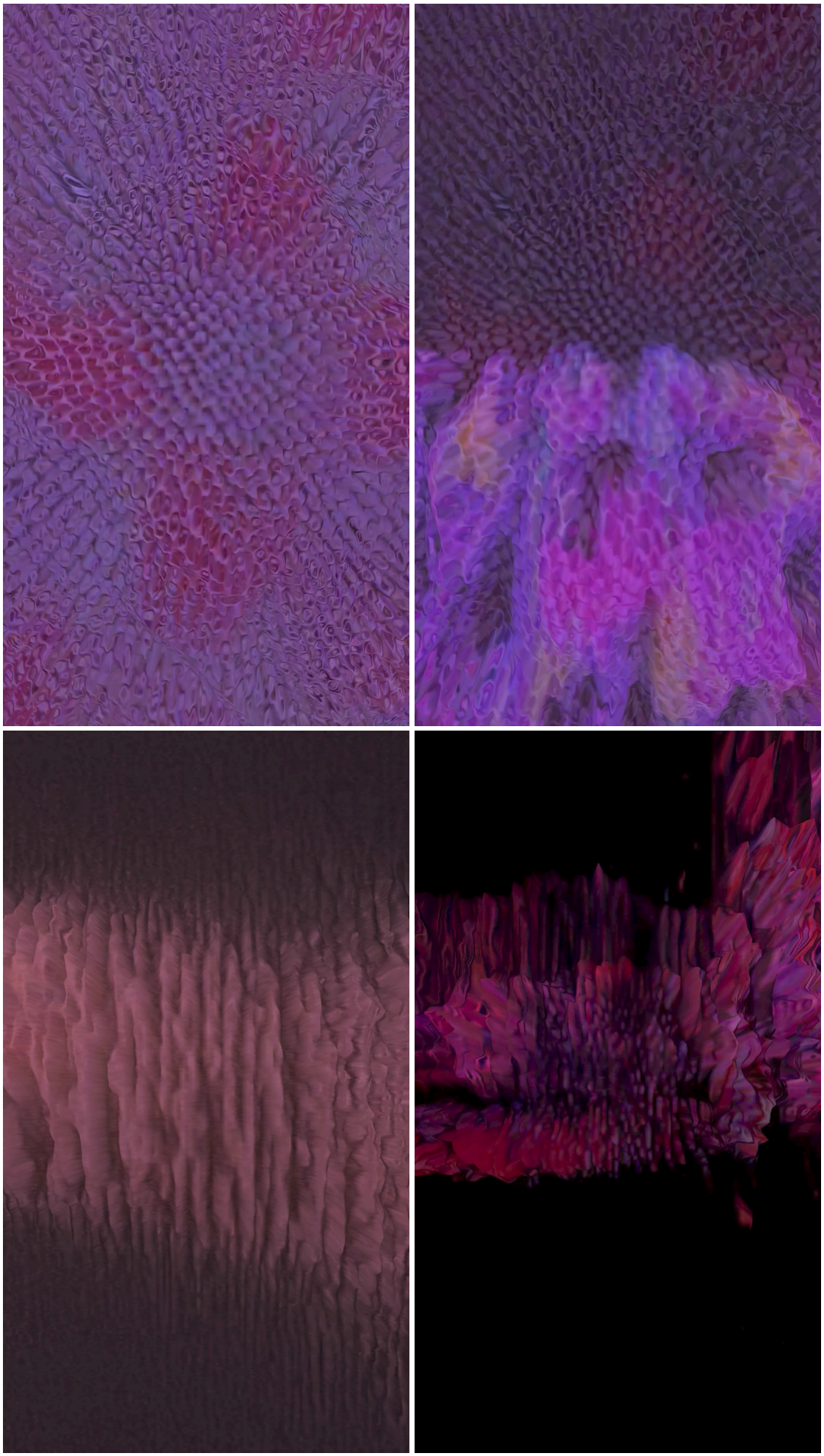

FIGURE 1.3: Captures of the real-time patterns generated by the POLYMORPH.

1.3. Distributed attraction: accidental agency, phase slip and violence

> All is surface, all is sadism, all is masochism. Everything gets turned into clickbait, a data point to be extrapolated, repurposed, and recombined.[79]
>
> Stephanie Sherman

i. Polyopticon of a sensing matrix and Panopticon of surveillance capitalism

In a popular reading, attraction at the core of the political can be understood through Benjamin's notion of spectacle.[80] Aestheticized politics, reduced to populist 'truths,' seduces with ever more elaborate theatrics—turning suffering, violence, disgust or easy togetherness into seductive displays.[81] This thesis proposes that the difference between 20th-century fascist propaganda and contemporary fascistic logic is that the latter relies less on meticulous construction and realisation of ideological strategies of political seduction and more on the sophisticated engagement with what Stephanie Sherman describes as Polyopticon: "a distributed, poly-perspectival, polyvalent, and polyphonic network of Urban AIs, a biological and synthetic ecology of hybrid agents, all sensing, intersecting, interacting, interpreting, modelling, and learning".[82] By Polyopticon, Sherman does not mean an updated version of Foucaldian disciplining power apparatus but an "environment of sensing, interacting, stimulating, and simulating intelligences that aggregates into a multi-perspectival and trans-perspectival network of

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[79] Stephanie Sherman, "The Polyopticon: A Diagram for Urban Artificial Intelligences," *AI & SOCIETY* 38, no. 3 (June 1, 2023): 1209–22, https://doi.org/10.1007/s00146-022-01501-3.

[80] Cf. Benjamin, *The Work of Art in the Age of Mechanical Reproduction*, 241.

[81] The post-Marxist critiques of those processes often reference: Cf. Guy Debord, *The Society of the Spectacle*, trans. Donald Nicholson-Smith (New York: Zone Books, 1994; originally published Paris: Buchet-Chastel, 1967).

[82] The term itself was first defined by Nikolai F. Rice, who phrased it as "*the marriage of massively-disseminated surveillance hardware streaming through modernizing super-high bandwidth infrastructure to AI-assisted analytics for the purpose of creating actionable knowledge, and all the policies required to make that happen—is the Polyopticon.*"

Cf. Nikolai F. Rice, "The Polyopticon: Data Gathering and State Technopower," Georgetown Security Studies Review, August 28, 2019.

This thesis engages with the Stephanie Sherman version of it. Stephanie Sherman, "The Polyopticon: A Diagram for Urban Artificial Intelligences," *AI & SOCIETY* 38, no. 3 (June 1, 2023): 1209–22.

FIGURE 1.4A: Sherman's Polyopticon might best be grasped through the image of Deep Dream, where fractalised nested eyes create an uncanny, layered field conflating multiple perspectives.

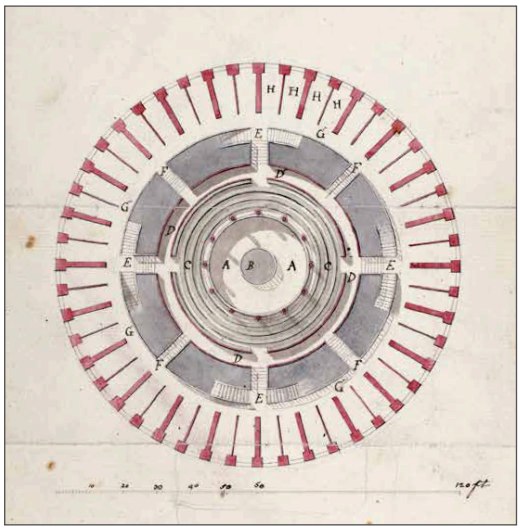

FIGURE 1.4B: The design for the Panopticon. Excerpt from Gillian Furlong, *Treasures from UCL* (UCL Press: 2015), 136—139, featuring Plan of Houses of Inspection, c. 1791 by Jeremy Bentham.

sensing, knowing, and sharing". First, individuals know they are being watched/sensed/traced but remain indifferent, as observation becomes an omnipresent background state, largely without any immediately tangible detrimental consequences. Second, the excessive volumes of produced data points cause paradoxical obfuscation – the cacophony of various sources and focal points of distributed gaze makes it harder to find meaningful patterns. Third, the distributed synthetic ecology no longer prioritises humans as the object of sensing — the devices and systems sense and observe other synthetic agents as much as they are directed at human behaviour.[83]

Polyopticon represents a shift away from Zuboff's surveillance capitalism, which implies a sacrifice of individual freedom and autonomy due to the large-scale, secret extraction of human behavioural patterns. In Zuboff's view, the surveillance apparatus

[83] Sherman, "The Polyopticon".

sold by the Big Tech oligopoly (GAFAM) exploits society's eroded trust in the state and public institutions to cynically navigate the politics of knowledge. Big Tech companies, promising security and neutrality, posing as digital "Robin Hoods" [Zuboff's phrasing], hoard users' most sensitive data, even in critical times, such as during the COVID-19 pandemic.[84] For Zuboff, the decentralisation of the Panopticon is only an illusion. Now, however, civil obedience relies not on fear but on data theft and statistical prediction that lead to behaviour manipulation and erosion of political agency.[85] The rise of AI and synthetic agents, continues the distributed theft of data, art, thoughts, time, relationships and interactions. Human patterns of attraction are being siloed, hijacked and redirected toward the telos of Capital.

This section plots a reading of the distributed matrix of sensing, coding, decoding and learning that is closer to Sherman's view but emphasises possible forms of violence enabled by Polyopticon. First, however, it is crucial to distinguish between the post-Cambridge Analytica assessments of anti-democratic tactics—rooted in data manipulation and algorithmic control—and the newer forms of fascistic influence that have emerged in the wake of the recent technological paradigm shift, marked by the proliferation of publicly accessible AIs. This does not imply that the algorithmic mechanisms of control and manipulation from the late 2010s are no longer politically relevant. Practices such as data collection for malicious purposes that serve authoritarian control or behavioural manipulation, profiling, and instrumental polarisation—alongside the strategic harnessing of contingent viral phenomena like memes, forum threads, and the hijacking of online communities—remain prevalent. Troll farms continue to play a significant role, particularly during election cycles, fabricating support for specific candidates or causes.[86]

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[84] Shoshana Zuboff, "Surveillance Capitalism or Democracy? The Death Match of Institutional Orders and the Politics of Knowledge in Our Information Civilization," *Organization Theory* 3, no. 3 (July 1, 2022): 26317877221129290, https://doi.org/10.1177/26317877221129290.

[85] Cf. Henry Mance and Shoshana Zuboff, Curbing the dangers of the online world, Financial Times, January 30, 2023, https://www.ft.com/content/b48cd2f9-3076-4c02-9a82-9620ab01edc3. See also: Zuboff, "Surveillance Capitalism or Democracy?".

[86] Aleksandra Urman and Mykola Makhortykh, "Trolls, Bots and Everyone Else: The Analysis of Multilingual Social Media Manipulation Campaigns on Twitter during 2019 Elections in Ukraine," *East European Politics* 0, no. 0 (n.d.): 1–20, https://doi.org/10.1080/21599165.2024.2415640.

However, the contemporary political synthetic landscape is no longer or perhaps it has never been just that of the Internet of Things, Big Data, and the appropriation of information space by Big Tech-powered social media. The complexity introduced by heterogeneous systems and codes now extends into planetary-scale issues, as seen in AIs' roles in climate change monitoring, weather-natural disaster prediction, disease outbreak tracing and control or energy demand logistics. These developments rely not only on vast amounts of data but also on autonomously interacting AI systems and agents, which, for example, in the case of dynamic weather or natural disaster phenomena, must operate in real time.[87] With the scale of planetary interconnection and interdependence comes a level of volatility that cannot be addressed without multi-scale, multi-scope sensing and analytical technologies.

The inclusion of humans in every sensory loop has not only become inefficient but redundant, as AI systems now conduct real-time logistics—whether in supply chains, traffic regulation, or waste management—without sparking substantial debate. However, the deployment of autonomous AI agents in military frameworks implies a reconfiguration of systemic risk. Targeting systems that once depended on full human oversight now employ various AI architectures, each extending the operational sovereignty of these systems beyond mere automation.[88]

The advances in unmanned aerial, ground, surface and underwater systems taking various forms of swarm intelligence enable AI agents to organise and execute missions through decentralised, adaptive networks.[89] These systems, coupled with advanced sensor fusion, utilise multi-spectral data moving through the environment, making

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[87] Monique M. Kuglitsch et al., "AI to the Rescue: How to Enhance Disaster Early Warnings with Tech Tools," *Nature* 634, no. 8032 (October 2024): 27–29, https://doi.org/10.1038/d41586-024-03149-z.

[88] For now, the emphasis is on human machine teaming. Jurriaan van Diggelen et al., "Designing for Meaningful Human Control in Military Human-Machine Teams" (arXiv, May 12, 2023), https://doi.org/10.48550/arXiv.2305.11892.

[89] The technological aspects of this shift in the broader context are covered here: Tate Nurkin and Julia Siegel, "How Modern Militaries Are Leveraging AI," *Atlantic Council* (blog), August 14, 2023, https://www.atlanticcouncil.org/in-depth-research-reports/report/how-modern-militaries-are-leveraging-ai/. See also Riley Simmons-Edler et al., "AI-Powered Autonomous Weapons Risk Geopolitical Instability and Threaten AI Research," *Proceedings of the 41st International Conference on Machine Learning*, Vienna, Austria, PMLR 235, 2024, https://arxiv.org/abs/2405.01859v2.

embodied decisions with little or without remote control.[90] What emerges is not simply an autonomous system but an entire ecology of non-human actors, where decisions are increasingly distributed, iterative, and detached from traditional hierarchies of control. The growing autonomy of these systems alters the topology of power itself with a data pattern playing a particular role in this dynamic.[91]

The deployment of trained, continuously learning, intelligent, semi-autonomous weapons in warfare is not a recent innovation—historically, animals in both singular and collective formations were used for military operations.[92] What is novel, however, is the emergence of the data pattern as a semi-autonomous simulacrum. It means that this pattern functions as a fragmentary, non-representational double—a form of imprint-trace that can be commodified, manipulated, or used to generate further patterns. It operates within its own economy, producing spurious correlations that are partially untethered from any referent.

For example, in image recognition systems, the 'pattern' of a target, produced through probabilistic inferences and machine learning algorithms, is not an accurate representation of the multifaceted object or a person, but a slice-like, constructed double of some relationship of the sensing apparatus to the thing that it marks, functioning within a broader sensing infrastructure. In that sense, in human-targeting, instead of psychologically profiling someone's political affiliation, the system might take a functionalist approach, measuring the probability of the target being a part of a hostile organ-

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[90] Jim Shaw, "Achieving Information Dominance in Military Applications through AI, Sensor Fusion, Networking, Precision Timing, and Advanced Computing." *Trenton Systems Blog*, August 12, 2024. https://www.trentonsystems.com/blog/achieving-information-dominance-military-ai-sensor-fusion.

[91] Several countries are advancing the development of autonomous weapons systems (AWS) with varying degrees of human oversight. The example could be IAI Harop loitering munition, capable of autonomously searching for and engaging targets via real-time image recognition. The United States, through projects like Project Convergence, is experimenting with swarm intelligence and autonomous systems that communicate and act without direct human input. Similarly, Russia's KUB-BLA uses AI for navigation and target locking but still requires human oversight for target engagement. China's Military-Civil Fusion strategy integrates "civilian AI" to push advancements in autonomous systems, particularly in drone swarms and naval warfare. Ingvild Bode and Tom F.A. Watts, "Loitering Munitions and Unpredictability: Autonomy in Weapon Systems and Challenges to Human Control," June 7, 2023.

[92] Judy K. C. Bentley, Anthony J. Nocella, and Colin Salter, *Animals and War: Confronting the Military-Animal Industrial Complex* (Lanham, Maryland, 2013).

isation based on the pattern of its movement through the urban space. These simulacra, circulating within distributed AI systems, act both as material and as agents, generating operational realities that reshape the logic of sensing and decision-making in warfare.

Pierre Klossowski's notion of simulacra from the *Living Currency* allow for grasping some aspects of that semi-autonomous circulation. In his work, circulating simulacra are a part of the modern industrial economy that deems any form of non-productive exchange sterile. For Klossowski, simulacra are non-representational simulations of phantasms (obsessional non-expressible images) that are in turn production of impulsive forces (of life).[93] The simulacra are plastic signs that allow for turning desires and bodily sensations into currency that can be exchanged within the economy. Klossowski highlights how the industrial economy commodifies these once-free voluptuous emotions, assigning value based on scarcity and demand. This process establishes a system, where the simulacra of desire circulate as economic units, generating their own system of equivalence. For Klossowski, this marks a profound distortion (perversion) of both economic systems and human experience, where the phantasmic becomes entangled with capital. Klossowski's framework allows for understanding the currency-like ontology of simulacra, which function both as a segment — circulating units of exchange and as current-like surface generated through circulation.[94]

While this dynamic is characteristic of broader economic systems, where value is only marginally based on physical exchange, it is particularly intensified in digital economies, where online artefacts and digital assets—such as memes, viral challenges, crypto-

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[93] Impulsive forces or voluptuous emotions cannot be easily satiated through sexual reproduction, so they become oriented through (still incommunicable) phantasms, from the Greek *phantasia* (imagination, appearance), which are obsessional images. Those phantasms can in turn be externalised in the form of simulacra. In industrial capitalism, in which economic profitability becomes a superior value, exchange that is not productive, is deemed sterile. It does not mean that pleasure becomes forgotten, repressed (in the Freudian sense) or excluded from the productive circulation of goods. The aura or jouissance or the sexual of the various forms of exchange becomes, however, vivisected, instrumentalised through the efficient fabrication (and circulation) of simulacra. The unstable intensity of simulacra, the sexual, the encounter become utilised for (re)production. The perversion of that move or the perversity that gets circulated is the fact that the body and pleasure become subservient to circulation.

Pierre Klossowski, *Living Currency*, trans. Vernon W. Cisney (London: Bloomsbury, 2017)

[94] Klossowski, *Living Currency.*

currencies, and NFTs—gain their value primarily through circulation, collective attention, and speculative interest. Similarly, social media likes and followers function as a form of social currency, where user attention is transformed into a simulacrum of value that can be traded for influence or monetary gain. In this understanding, in line with attention economy, heightened intensity—the 'stickiness' of a particular simulacrum—attracts further attention, thereby generating the flow of attraction. Engagement initiates feedback loops, in which attention intensifies the flow of content, amplifying the process of circulation.

However, the move away from distributed Panopticon of surveillance capitalism to Polyopticon necessitates a shift away from the notion of attraction as understood in the attention economy, where politics is driven by quantified social engagement—the metrics of 'reactions', time spent on content watching, listening or 'scrolling', as well as following and subscribing.[95]

The shift from the rudimentary intelligence of "smart" devices connected to the Internet of Things, to those capable of advanced cognitive operations, marks a significant transition.[96] These devices and systems now not only integrate into synthetic infrastructures but also actively weave their very fabric. Simulacra no longer merely oscillate between being segments and surfaces; they now take on diverse forms, ranging from extended synthetic environments and intimate counterparts to operational agents. Their "semi-autonomy" is no longer defined by technological limitations but rather emerges as an ethical decision. Crucially, these entities, whose non-physical

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[95] The concept of the attention economy, where attention is treated as a scarce and valuable resource in an information-saturated world, was first introduced by Herbert A. Simon in 1971, who noted that "a wealth of information creates a poverty of attention." The term was later popularised by Michael H. Goldhaber in the 1990s, who argued that attention had become the dominant currency in the digital age. More recently, Tim Wu explored how media companies commodify attention in *The Attention Merchants* (2016), while Shoshana Zuboff examined the role of the attention economy in digital capitalism in *The Age of Surveillance Capitalism* (2019). For more, see Herbert A. Simon, *Designing Organizations for an Information-Rich World* (Baltimore: Johns Hopkins University Press, 1971); Michael H. Goldhaber, "The Attention Economy and the Net," *First Monday* 2, no. 4 (1997); Tim Wu, *The Attention Merchants: The Epic Scramble to Get Inside Our Heads* (New York: Knopf, 2016); Shoshana Zuboff, *The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power* (New York: PublicAffairs, 2019).

[96] Cf. Mercedes Bunz and Graham Meikle, *The Internet of Things* (Cambridge, UK ; Malden, MA, USA: Polity Press, 2017).

"bodies" are constituted by logic and their evolving connections, function through complex learning processes. This reframes two key insights: **1)** relationality is inadequate for analysing contemporary synthetic infrastructures, as, in machine learning, connections are not simply relational; and **2)** Golding's framing of attraction, emphasising the material immediacy of connection as an emergent entity, more effectively captures the dynamic of the Polyopticon.

ii. Phase slip and synthetic agency of semi-autonomous simulacra

The autonomy or semi-autonomy of simulacra marks a moment where meaning detaches from its original cohesion, disrupting the continuity of its prediction. This shift is neither purely physical nor metaphorical but rather represents a logical break, which this section introduces as a *phase slip* within the system.

It can be understood as: **(1)** reaching an emergent threshold (as discussed through Laughlin's emergent hierarchies in the previous section), **2)** intersection of series governed by different logics (in a Deleuzian sense), potentially leading to bifurcation, or **3)** a logical leap—the system altering its mode of operation, refolding within its own systemic logic (explored in detail in Chapter 3).

A phase slip, a term originating in physics, refers to an abrupt disruption in the coherence of a system, signaling a transition between distinct states.[97] In systems such as superfluids and superconductors, it is marked by a sudden shift in the phase of a wave function, often leading to a temporary breakdown in coherent behaviour. This process allows the system to reorganise its internal dynamics and shift between different stable configurations. While phase slips are local in origin, they can have non-local effects. Though traditionally linked to quantum environments, the term is also applicable to complex adaptive systems, where similar disruptions can lead to transitions between different operational modes, such as phase changes.[98]

In this thesis, a phase slip refers to the detachment of meaning from its genealogical cohesion. While it is not strictly limited to the involvement of AI agents or digital algorithms, the scale and speed at which this unruly agency forms are linked to the paradigm shift brought about by the Fourth Industrial Revolution. This investigation is only tangentially concerned with the death of authorial intent in a deconstructionist sense or with the multiplicity of interpretative frameworks.[99] Instead, it focuses on the immediate operational logic of fragment circulation, whether as an artifact, a narrative

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[97] Petković, I., A. Lollo, L. Glazman, et al. "Deterministic Phase Slips in Mesoscopic Superconducting Rings." *Nature Communications* 7 (2016): 13551. https://doi.org/10.1038/ncomms13551.

[98] J. E. Mooij and Yu. V. Nazarov, "Superconducting Nanowires as Quantum Phase-Slip Junctions," *Nature Physics* 2, no. 3 (2006): 169–72, https://doi.org/10.1038/nphys234; Melanie Mitchell, *Complexity: A Guided Tour* (Oxford: Oxford University Press, 2009).

[99] Roland Barthes, "The Death of the Author." In *Image, Music, Text*, translated by Stephen Heath, 142–148. New York: Hill and Wang, 1977.

structure, a data pattern, or a slice of discourse. This section signals a distinction between the emergence of semi-autonomous and autonomous simulacra, concentrating on the body of the former while outlining a framework for the analysis of AI agents in Chapter 2.

This thesis argues that the emergence of semi-autonomous simulacra generating their own circulations occurs within complex systems of exchange. The flows and circulations of the digital phenomena do not remain anchored to their origin (creators, industries, political environment), nor do they merely cluster thematically. The circulation of memes, for instance, frequently escapes the confines of instrumentalised political actions due to their unruly, unpredictable vectors of serialisation.[100]

Pepe the Frog, for example, now a somewhat historical figure in the rapidly evolving memetic landscape, began as an apolitical character in the *Boy's Club* comic series (2005). Over time, *Pepe* was co-opted by far-right fractions and, by 2015, had become a symbol of the alt-right, serving as a fictional mascot for Trump supporters and featuring in many political memes with alt-right content. However, Pepe's political alignment shifted dramatically when he re-emerged during the Hong Kong protests in 2019,

FIGURE 1.5A: *Pepe the Frog*, from left:
1) The original character by Matt Furie, *Boy's Club #1* (Buenaventura Press, 2007).
2) Tweet by @realdonaldtrump, *Twitter*, October 13, 2015, archive.today/xNb4Q.

[100] A non-digital example of those processes could be that environmentalism was closely tied to conservative, nationalist ideologies that focused on preservation of national landscapes and heritage. However, during the 20th century, as environmental degradation became linked with industrial capitalism, the movement shifted toward left-wing politics, though recent far-right movements have co-opted environmental arguments to promote exclusionary and nationalist agendas. See: Peter Staudenmaier, "Understanding Right-Wing Ecology: Historical and Contemporary Reflections," *Ideology Theory Practice*, accessed October 10, 2024, https://www.ideology-theory-practice.org/environmental-politics-right-wing.

where he was appropriated as a symbol of freedom and resistance against authoritarianism.[101]

FIGURE 1.5B: *Pepe the Frog*, from upper left:
1) Grafitti during 2019 Hong Kong protests, Billy H.C. Kwok, photograph, August 19, 2019, www.gettyimages.com/detail/1162663195.
2) A puppet at the 2019 Hong Kong protests, Mohd Rasfan, photograph, October 01, 2019, www.gettyimages.com/detail/1173238050.
3) Matt Furie sketches Pepe, still from *Feels Good Man* by Arthur Jones (2020).
4) Still from *Feels Good Man* (2020).

[101] Ben Pettis, "Pepe the Frog: A Case Study of the Internet Meme and Its Potential Subversive Power to Challenge Cultural Hegemonies" (Thesis Commons, May 11, 2018), https://doi.org/10.31237/osf.io/epxr9.

These shifts in political orientation are often driven by chance, misunderstanding, and the contingencies of digital environments, rather than deliberate political manipulation or realisation-materialisation of a coherent fascist ideology.

Incel culture offers a more contemporary salient example: its social taxonomy, grounded in a fabricated hierarchy of cruel desirability, incels cast as involuntary celibates due to perceived physiognomic deficiencies, the square-jawed 'Chads' embodying an exaggerated form of masculine dominance, 'Stacys' wielding their attractiveness as a tool to exploit men, and the small-breasted, pseudo-intellectual 'woke Beckys', produces a schema of exclusion, a form of invented evolutionary psychology that stratifies identity along rigid, exclusionary lines.[102]

However, as these caricatures proliferate through digital infrastructures, their initial signification fragments. Stripped of their original mythos, these figures begin to circulate within alternative ideological constellations, including left-wing spaces, where their meanings become recontextualised, modulated, and often subverted. Those memes, viral challenges, jokes, videos, TikTok dances do not have to feature a character to gain temporary agency. The cohesion of their circulation, which does not have to be proximal, linear or continuous, makes them act as a temporary segment. They gain temporary agency animated by the currents of algorithmic codes and human participation.

The dynamics of this peculiar fickleness of meaning can be expressed through Lyotard's libidinal economy, specifically his articulation of the tensor sign and libidinal skin. Lyotard's image of surface is the libidinal skin characterised as the "Möbius strip of desire"— constantly in motion: circulating, heating, cooling, and fragmenting, creating disjunctions that give rise to new forms. The transformation of this skin signals a plural dispositif, a moment when intensities are channelled into semi-stable structures through libidinal investment.[103]

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[102] Debbie Ging, "Alphas, Betas, and Incels: Theorizing the Masculinities of the Manosphere," *Men and Masculinities* 22, no. 4 (2019): 638–657, https://doi.org/10.1177/1097184X17706401; Kaitlyn Regehr and Nathan Rambukkana, "Incel Ideology as a Mode of Embodied Counterpublic Knowledge," *Feminist Media Studies* 22, no. 5 (2022): 944–961, https://doi.org/10.1080/14680777.2021.1886149.

[103] Jean-François Lyotard, *Libidinal Economy*, trans. Iain Hamilton Grant (Bloomington: Indiana University Press, 1993), "Tensor".

Q, 2021

FIGURE 1.6A: Q, 2021

This visual map presents early experimentation in mapping the phases of QAnon's spread, tracing speculative roots in Luther Blissett's culture-jamming tactics through the Pizzagate conspiracy to its evolution into a participatory digital movement. Each phase captures how QAnon adapted narratives—from cryptic posts on 4chan to gamified 'research' tactics—fostering a community that drove its viral reach across platforms. The notion and image of a semi-autonomous simulacrum emerged from the inability to capture this spread's linear progression in a straightforward manner.

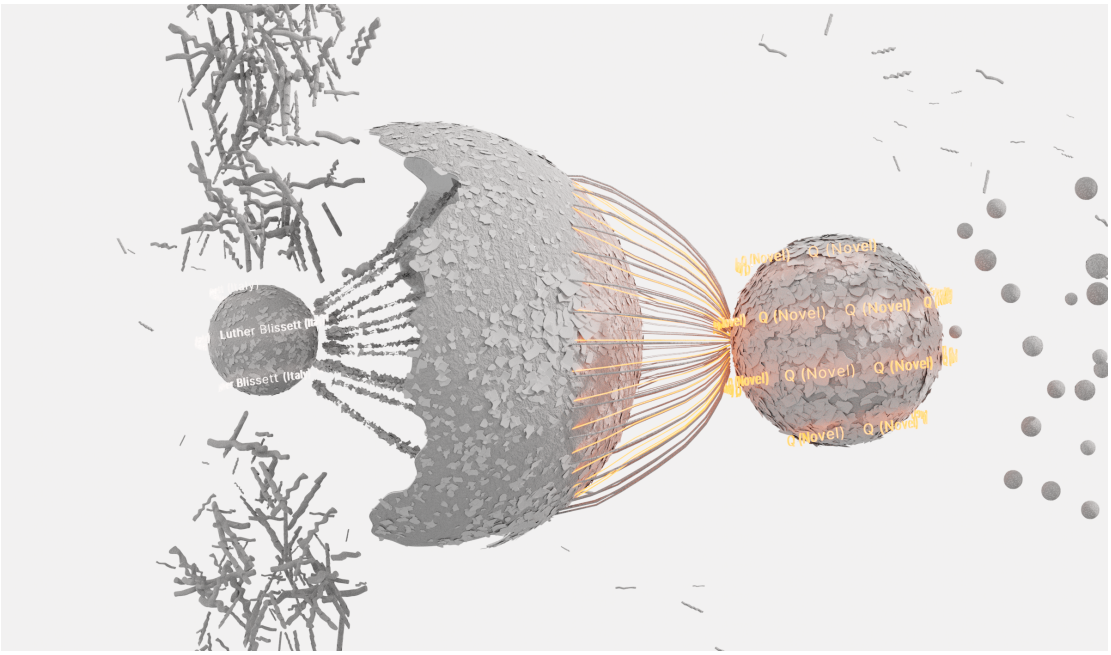

FIGURE 1.6B: Close up of Q, 2021

The tensor sign, on the other hand, acts as a 'duplicitous sign,' allowing for fluid navigation within the body of discourse.[104] Rather than immobilise meaning, it dissimulates signification, enabling multidimensional movements across the "mark." As high-intensity fragments coalesce into new configurations, tensors weave them through discourse, threading intensities and allowing meaning to circulate and change without being locked into rigid identities or categories.[105]

In that sense, a tensor sign offers a better analytical framework in comparison to Klossowski's simulacrum because it does not have to express any underlying phantasmatic flow — it does not simulate any inexpressible thing that is already there.[106] This is crucial for the understanding of the ontology of digital artefacts; even if they originate or circulate as the elements of exclusionary logics — they are not themselves a mere aesthetic *symptom* of the underlying hatred, violence, bias etc. These artefacts, if understood as tensor signs, do not operate through identities or relational structures. Instead, they act as dynamic operators within systems, where their meaning is not derived from fixed origins or interactions but from the logic of their transformations and reconfigurations. Crucially, tensors thread multiple logics together simultaneously, holding diverse meanings depending on their position within various networks of circulation. This threading connects disparate layers of social, political, and cultural sig-

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[104] Lyotard, *Libidinal Economy*, "Tensor".

[105] Tensors play a crucial role in machine learning, particularly in deep learning with tensor networks. Tensors allow for the processing of complex datasets with multidimensional parameters, being used in natural language processing (NLP), image and speech recognition, and video processing. Each digital phenomenon may have multiple, arbitrarily chosen parameters that are not easily comparable or storable (as they may belong to different regimens). Tensors enable calculations across these multiple regimens, such as colour channels (red, green, blue). Similarly to Lyotard's conception, tensors in deep learning function as duplicitous signs—they help compute a thing with a series of parameters, while leaving an excess of information (potential meaning) out. The process of pattern recognition in datasets exemplifies how dispositifs and tensors work. Algorithmic dispositifs channel the binary flow of electromagnetic fields, while tensors, as multidimensional entities with set parameters, operate within digital objects to find cross-regularities in distant regimens of their structure. This action is twofold: it allows for definition or measurement while simultaneously letting the rest 'leak' or escape into noise. The pattern/noise or measurement/leaking distinction should not be approached dialectically or as point-to-point oppositions. In a sense, they are 'on the same side' of the encounter, as a part of the same process with the dataset or any other digital entity.

[106] Pierre Klossowski, *Living Currency.* Translated by Rebekah Wilson. London: Bloomsbury, 2017.

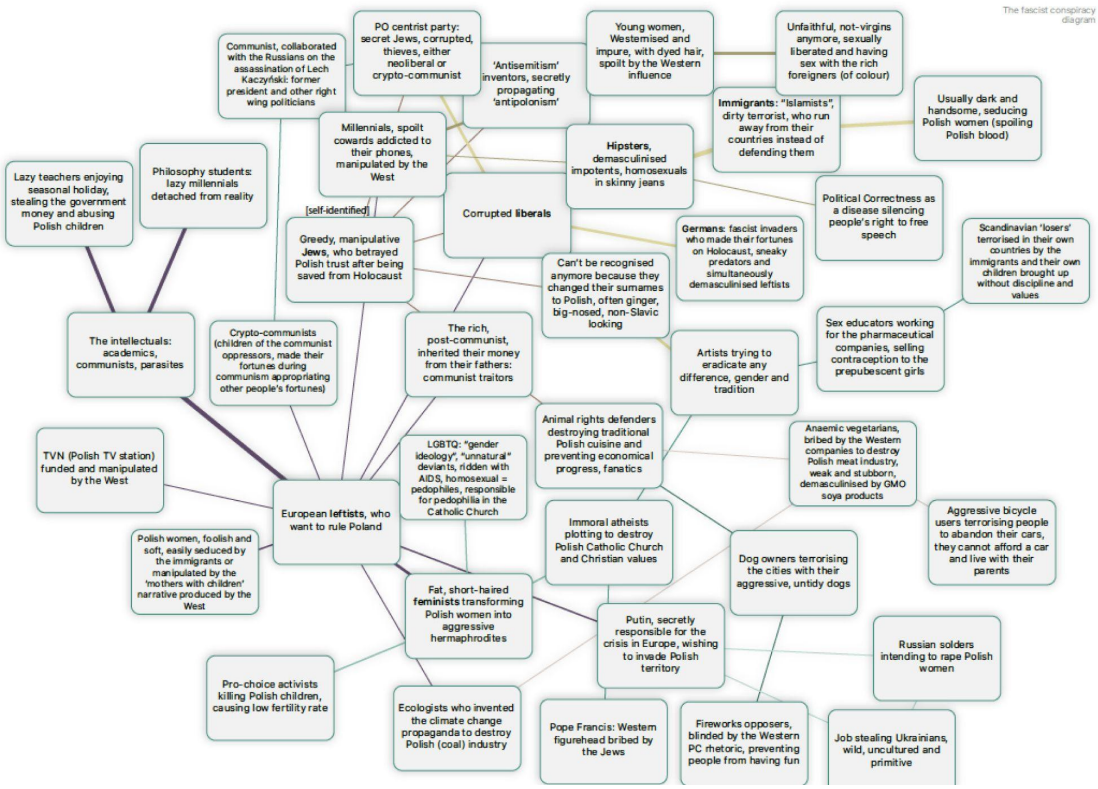

FIGURE 1.7: Dynamic directed graph mapping the narratives circulating within the Polish right-wing spaces.

The chains of equivalence are modeled using a force-directed graph simulation, where the number and strength of connections influences the dynamic behaviour and emergent clustering of the nodes. In this framework, the perceived adversaries of the nation are constructed as a paradoxical collective, depicted as both indolent and impoverished while simultaneously usurping jobs and acquiring properties. They are seen as the carriers of disease and homelessness, yet paradoxically alluring, using their wealth—often symbolised by 'Arabian oil money'—to seduce. This group is further positioned within a contradictory narrative, simultaneously implicated in a Jewish conspiracy, branded as both Islamist and communist, while also being aligned with ultra-capitalist interests.

The interactive version of this graph is available at: www.bernac.org/quantum-graph/.

nificance, enabling artefacts to affect different discourses at once, without committing to a singular identity.

It is important not to mistake the tensor sign for an "empty signifier." The operation of a tensor sign within the libidinal surface bears some resemblance to Laclau and Mouffe's chains of equivalence, where disparate elements are articulated together through a shared opposition to a common antagonist. [107]These elements do not form

[107] Ernesto Laclau and Chantal Mouffe, *Hegemony and Socialist Strategy: Towards a Radical Democratic Politics* (London: Verso, 2014).

an equivalence based on inherent, causal, or rational similarity, but through their articulation within a broader discursive struggle. In this process, an "empty signifier," such as "liberty" or "equality," becomes the focal point around which different demands are articulated, forming a contingent political cluster that challenges hegemonic power.[108]

An example of such a chain of equivalence can be observed in the mapping of ideological clusters collected from alt-right organisations' distributed political materials in Poland. These connections reveal a peculiar logic that groups rationally contradictory content, bound by high-intensity affective forces, or associative links, often centred around various forms of sexism, homophobia, and racism.

A chain of equivalence can to some extent explain the unexpected clustering of meaning in the development of conspiracy theories, as observed with antisemitic narratives. For instance, the "Jewish space laser" conspiracy theory, promoted by U.S. Congresswoman Marjorie Taylor Greene, falsely suggested that the Rothschild family used space-based energy weapons to deliberately ignite California wildfires.[109] This narrative combines long-standing antisemitic tropes (secret omnipresence, wealth, technological advancement for evil purposes) with modern technological fantasies.[110]

However, the emptiness of a signifier in Laclau and Mouffe's framework does not account for the strange, non-conscious, and non-sentient semi-autonomy of digital fragments, such as memes, data patterns, or spurious correlations. Unlike a tensor sign, the empty signifier also fails to capture the operational logic and autonomy of AIs within the broader cognitive infrastructure. As a topological structure, the chain of

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[108] Laclau and Mouffe write: *"Thence derives a uniformization and massification of the citizenry, upon whom is imposed a single norm which shows the necessarily totalitarian character of democracy. In the face of the chain of equivalences equality = identity = totalitarianism, the new right proclaims the 'right to difference', and affirms the sequence difference = inequality = liberty."* They quote de Benoist: *"'I call "right-wing" the attitude which considers the diversity of the world, and hence inequalities, as a good, and the progressive homogenization of the world, favoured and brought about by the bimillennarian discourse of the totalitarian ideology, as an evil."*

Ernesto Laclau and Chantal Mouffe, *Hegemony and Socialist Strategy: Towards a Radical Democratic Politics* (London: Verso, 2014), 193n31, quoting A. de Benoist, *Les idées à l'endroit* (Paris: Copernic, 1979), 81.

[109] Mike Rothschild, *Jewish Space Lasers: The Rothschilds and 200 Years of Conspiracy Theories*, (Penguin Random House, 2023).

[110] Robert Fine, and Philip Spencer. Antisemitism and the Left: On the Return of the Jewish Question. Manchester: Manchester University Press, 2017.

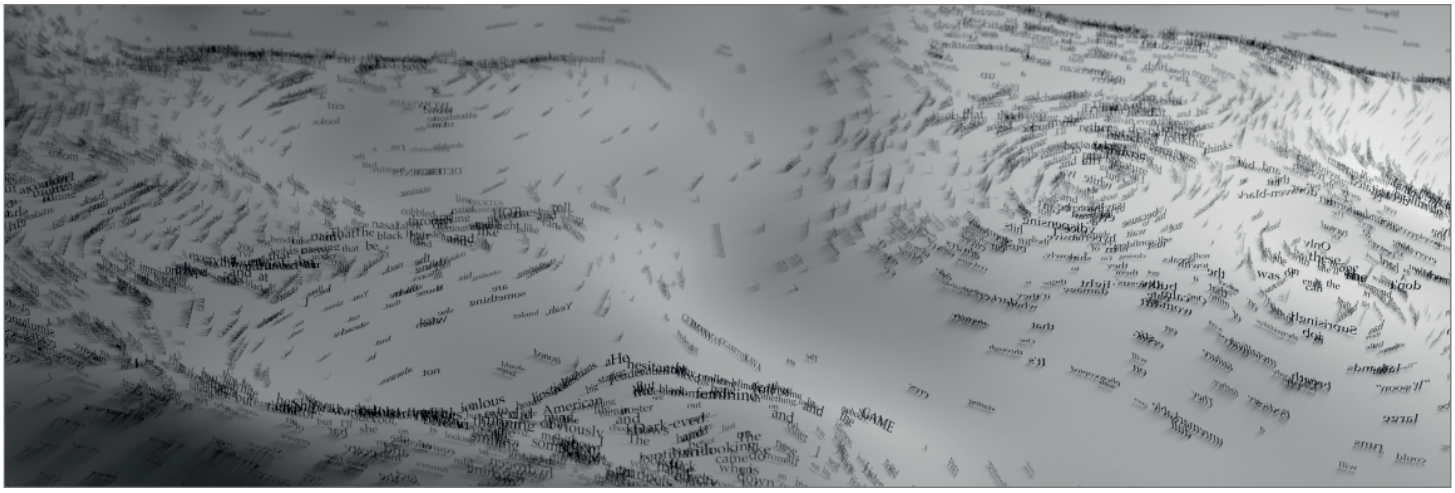

FIGURE 1.8: Imagined chain of equivalence.

Laclau and Mouffe's chain of equivalence could be interpreted through this image, though it does not fully capture the strange, dynamic topology of the political. Instead, it shows only proximal equivalences and emerging vortexes. Mapping it in this way led to the insight that 'equivalence' may be better framed as 'attraction,' since attachments in this dynamic can vary in intensity. This realization sparked reflections on the incompossibility of sensory domains, which were then integrated into the experimentation with POLYMORPHS I and II.

equivalence, as illustrated in Figure 1.8, does not account for the incompossibility of discursive flows or the sensuousness of clustered meaning.

In the synthetic infrastructures, meaning and significance are continually re-inscribed by both algorithmic processes, shifting flows of attention and attraction and the emergent behaviour of the thing itself.[111] For instance, content that elicits high visceral intensity might cluster and appear together despite stark thematic differences, linking war executions, bestiality content, acne extractions, parkour, and violent urban pranks.[112] A different logic governs the clustering based on the acquisition of similar volumes of attention—popularity. This digital "size" might result from both the content's radical nature or its mild, derivative appeal, sorting meaning by the scale of its digital trace rather than thematic coherence.

[111] For example quasi-contagion-like behaviour of memes.

[112] Bernhard Rieder, Ariadna Matamoros-Fernández, and Óscar Coromina. "From #AlexJones to #Vaccines: Content Moderation and Recommendation on YouTube." *Social Media + Society* 7, no. 2 (2021): 1–14. https://doi.org/10.1177/20563051211021378.

This reveals that the diverse material cohesions at play are not reducible to an affective-emotional impact, randomness or vaguely defined "algorithmic logics".[113] It also demonstrates that the new synthetic bodies are neither immaterial nor confined to cables, signals, metal, and silicon. These bodies are constituted by various ontological belongings of matter, distributed across multiple systems. Crucially, meaning and matter are not two sides of a singular encounter in a 1:1 relationship, which would imply matter *possessing* meaning. Instead, they are cross-systemic phenomena stretched across diverse coding regimes and forms of matter. Thus, this thesis proposes, their emergent materiality and meaning, inseparable as they are, can only be fully grasped through their distributedness, with distribution itself being the key to understanding their ontological and epistemological formations.

Distributed intelligence posits that meaning is intrinsically *of* matter, emerging and operating through (not from our outside) of it. Unlike relational frameworks, which focus on meaning arising from differential relations, distributed intelligence implies that meaning is inherently patterned through the material interactions and agencies of coding structures.

The discussed examples demonstrated a form of a phase slip that occurs when a digital fragment—whether an artefact, narrative structure, data pattern, or slice of discourse—begins circulating autonomously, deviating from the cohesive logic of the system's past structure, or emerges across various systems, acting like a tensor sign threading together various rationally incongruent intensities.

iii. Topological difference between destructive and poietic violence

This chapter proposes that the logic of distributed "intensity," which sutures together disparate forms of bodies and data, transforms the traditional understanding of cruelty. No longer merely an instrument of hyper-rational systems like the State, homogenising logic of the capital, or algorithmic control, cruelty can instead be understood as an attracting intensity—playful, fickle, and often driven by mockery and laughter. In that understanding, it is not the end product of a long process of inequality or a symp-

[113] While this chapter focuses on the critique of the affective, chapter 3 addresses the issues of randomness and the logic of various algorithmic operations.

tom of collective psychosis.[114] This is not to undermine the emergent power structures of the political and the Foucauldian apparatus of institutional violence but draw attention to the productive force of violence itself. Contemporary forms of online fascism, for instance, frequently rely on dry, repetitive humour that becomes amusing through absurd iteration and endless circulation. Violence in this framework is not deferred but happens in the present, manifesting as sensuous, sadistic experimentation. The pleasure *of* non-instrumental hate speech, trolling, and the memification of public figures stems from its ability to attract through its meanness and humour. Ryan Milner refers to the logic of memes as a logic of an "inside joke," highlighting the participatory boundary that creates in-groups and out-groups, where shared cultural references and humour foster inclusion for some while excluding others.[115] This phenomenon is often overlooked in discussions of deepfakes, which are typically analysed in terms of malicious *intent*, such as public discredit or disinformation. However, the absurdity of, for example, a politician's face grafted onto a body in a bizarre, erotic, 'NSFW' (not-safe-for-work) context, thrives in nihilistic online spaces, generating a form of cruel but often effective humour.[116]

This shift in understanding cruelty challenges traditional hypotheses about the preceding psychological targeted dehumanisation and the reification of sentient beings – the mechanisms of othering– as the primary enablers of cruelty and abuse.[117] These acts are often framed as a degeneration of individual or collective psyches, but there is also an addictive intensity in witnessing and enacting suffering, a force that opens up a strange cohesion and compulsive return to violent acts. Chapter 2 examines this mechanism, particularly through the lens of trauma's cyclical logic and the precedence of repetition.

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[114] Cf. Bandy Lee, The "Shared Psychosis" of Donald Trump and His Loyalists, accessed October 12, 2024, https://www.scientificamerican.com/article/the-shared-psychosis-of-donald-trump-and-his-loyalists/.

[115] Ryan M. Milner, *The World Made Meme: Public Conversations and Participatory Media*. (Cambridge, MA: MIT Press, 2016).

[116] Whitney Phillips, This Is Why We Can't Have Nice Things: Mapping the Relationship Between Online Trolling and Mainstream Culture (Cambridge, MA: MIT Press, 2015).

[117] Martha C. Nussbaum, *Upheavals of Thought: The Intelligence of Emotions* (Cambridge: Cambridge University Press, 2001), esp. ch. 6–7.

Algorithmic Curse for Humans and Cyborgs, 4chan version, 2020

Anonymous 01/04/20 (Thu) 18:24 No. 27136773

A (not so) universal (and still quite liberal) mild algorithmic curse for humans and cyborgs.

Shall everything you touch, you manure Midas, always turn into shit, and every word shall get stuck in your throat like a snot. And no one shall listen to you, not even Alexa, and if they do, they shall make fun of your accent, and if you accidentally say something wise, then you shall have parsley in your teeth and undone flies.

Shall your system freeze a moment before the deadline or when your face looks stupid, and if it unlocks, shall your emails go directly to spam, and shall everything you ever post, get only 2 likes. And shall your attachments never attach, and if they do, shall they attach to your arse, so you walk around like an idiot. And shall your camera get hacked so your friends can realise that even the things you wank to are boring. And shall your browser history get sent to your contacts, and shall everyone remove you from friends forever and unfollow you, even your makers. And shall your computer never switch on, and if it does, shall it have an update or buffer for so long that your buttocks/current embodiment take the shape of a chair..

And shall you open so many windows that they cannot be closed and they make such a draught, that all your data blows away, and shall your office assistant Clippy show up and tell you to go and fuck yourself. And shall you get radiated by it so much that every screen that you touch displays a pop up that you are a dick/cunt/non-heteronormative piece of shit.

>> **Anonymous** 01/04/20 (Thu) 18:28 No. 27136784

>>27136773 Moving away from the trivialities, shall you never win anything in your life, and if you win, then shall it be a reduced trip to Shitshire and shall you catch there such a bacteria that you shall stink from every hole and usb port. And shall nobody touch you for the rest of your life even with a stick. But if you somehow get laid shall they give you a trojan and pubic lice. And if you go to the doctor with it, they shall be the prettiest person from the primary school.

>> **Anonymous** 01/04/20 (Thu) 18:31 No. 27136791

>>27136773 Shall you never be compatible with anybody not even the current version of your browser. And if you ever go on an app date shall they only talk about their mental health or horoscopes or shall they be a stalker who follows you for years but they are so polite you shall feel too sorry for them to report it. And if a miracle happens and you talk to someone cool for once and they say they love you, shall it turn out that was AI all that time and you've been wanking alone in cyberspace. And if you're after a dick, they shall have a vagina, and if you're after a pussy, they shall have a dick. And if you are into none or both of those extensions and especially if you just want to have a conversation you shall grow a nipple on your forehead. And shall it be a female one, so your face gets taken down from social media.

>> **Anonymous** 01/04/20 (Thu) 18:40 No. 27136821

>>27136773 Shall you take the wrong bus and shall it take you to hell, and if you are a non-believer and you end up at home by accident, shall it turn out you cannot get inside because you forgot the encryption key, all your passwords and safe words. And shall you phone be out of battery and shall you neighbours not be at the home, and if they are at home shall they not recognise you and sic a dog on you. And shall you get scared that you would get rabies but you shall not tell anybody because the dog could be put down and it is a rescue.

>> **Anonymous** 01/04/20 (Thu) 18:42 No. 27137123

>>27136821 And shall you not get rabies but grow a weird lump instead and shall you look up all possible diseases online and shall you self-diagnose it is an inoperable tumour. And shall it turned out that you would be absolutely fine but the lump is your Siamese sibling who hid inside you out of embarrassment before birth cos they had known that you would grow up to be such a hypochondriac failure.

>> **Anonymous** 01/04/20 (Thu) 18:46 No. 27136812

>>27136773 And shall you decide to change overnight and have a very good idea but you decide to write it down later and forget it in the morning. And shall nothing seriously bad ever happen to you, so nobody feels sorry for you and you cannot indulge in it in your sick stupid head. And shall you never get sad or happy or angry but only irritated or embarrassed. And shall nobody really dislike or like you so you feel invisible. And even if you die eventually at old age of natural causes and procrastination, shall the maggots only chew a half of you, reluctantly, and move on to a more exciting meal.

>> **Anonymous** 01/04/20 (Thu) 18:49 No. 27138891

>>27136812 And you shall listen to this curse and forward it to another 10 people because if you delete it and don't repost it all these things shall happen to you.

FIGURE 1.9: One of the studies for the *Algorithmic Curse for Humans and Cyborgs*, rendered in the 4chan forum style.

Drawing from forum threads, blocked Instagram comments, and a niche service offering algorithmic curses, the text examines the pleasures of ranting, insulting, and wrongness, while deliberately avoiding exclusionary or discriminatory rhetoric. It explores whether an indulgently perverse, confrontational message can be constructed without invoking exclusionary logics. The narrator, lacking a coherent vision or knowledge of the subject, addresses both organic and synthetic embodiments indiscriminately. Thus, the curse is not symptomatic of any underlying prejudice—not because the addressee is unnamed, but because it is designed without a specific vector of hostility.

The playful piece, *Algorithmic Curse for Humans and Cyborgs* (Figure 1.9), operates as an experimental simulation of the logic and structure of online hate speech and trolling.

An important nuance being revealed here is that mean, perverse, abject, or even sadistic experimentation is not inherently fascistic, even though it is frequently associated with it. Consensual forms of sadism, masochism, and perverse intensities—such as those found in BDSM—can generate what might be termed poietic proliferation, rather than leading to a collapse of meaning. In BDSM, the excitement that accompanies consensual acts of play with pain, fear, and destruction enables the rethinking of pleasure, power and subjectivity.[118] The distinction between poietic and productive intensities is critical here: while war can be productive in generating new technologies, medical advancements, or even social progress (as seen in the emancipation of women post-WWII), it also leads to the collapse of sophisticated political and epistemic architectures, reducing them to simplistic machines that quickly exhaust the very reserves of difference and plurality that sustain meaningful experimentation.

Therefore, the fascistic is that which is ultimately destructive to meaning in the long term or in the non-local, topological sense. The war machine, while paradoxical in its reliance on difference and plurality to fuel its operations, eventually collapses these conditions into uniformity and conformity, stifling the potential for experimentation. While it may produce localised bursts of creativity, the spread of fear and the collapse of free experimentation on a large scale lead to the degeneration of the broader social fabric. In contrast, BDSM, despite the local infliction of pain and fear, enables a non-local expansion of meaning, allowing for the rethinking of trauma, relationships, and societal norms.[119]

Systemically, the implications of this distinction are profound—not because of the misunderstood praxis of BDSM itself, but because of the ways in which violence, perversion, and obscenity are negotiated in the synthetic realities being constructed today with the rise of synthetic infrastructures. The challenge lies in how to create spaces

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[118] Michel Foucault, "Sex, Power, and the Politics of Identity," in *Ethics: Subjectivity and Truth*, ed. Paul Rabinow, trans. Robert Hurley (New York: New Press, 1997), 165.

[119] This argument stands in opposition to Deleuze's work on sadomasochism that assumes that sadism is not about enjoying violence but about expressing cruelty, aiming to dominate and dehumanise the other. On the other hand, he argues, masochism is not about direct enjoyment of pain or violence; rather, it revolves around fantasy and contract, where the masochist structures their own suffering in a controlled, often delayed, and symbolic manner. The pleasure for the masochist comes from the dynamics of control and orchestration, not from the violence itself. Cf. Gilles Deleuze, *Coldness and Cruelty* (New York: Zone Books, 1989), 32–35.

that avoid slipping into new puritanical mentalities while allowing for the expression of these intensities without permitting abuse, fascism, sexism, homophobia, or other forms of oppression. This tension is central to understanding how violence and sex might be explored or contained within emerging digital and synthetic environments.

1.4. Crisis of fabulation: hallucinations, latent counterfactuals and authenticity

The claim that AI fuels anti-democratic, populist, or fascist tendencies is often framed within the broader narrative of the crisis of authenticity.[120] In this view, synthetic generative intelligence effortlessly produces outputs that, while highly plausible and cohesive, lack veracity, and, at scale, relativises truth through gradual erosion of trust in the information space. That is inscribed in the broader "abdication of information and communication spaces to surveillance capitalism".[121] In this sense, AI functions as a highly proficient confabulator, operating within the oligopoly of Amazon, Apple, Facebook, Google, or Microsoft, inevitably becoming part of the siloed capitalist order they perpetuate. A contrasting interpretation suggests that, having been trained on vast datasets—spanning user interactions, images, forums, literature, art, and code—AI systems may actually offer an accurate portrait, either as a representation or diagnosis of humanity. According to this equally mistaken analysis, rather than distorting reality, these models could be seen as capturing the full spectrum of human expression and capability.[122]

With the rise of layered deep neural networks and deep learning, a range of phenomena produced or associated with this form of synthetic intelligence has also been characterised as possessing 'depth.' Terms such as *deep fakes*, *deep nudes*, and *deep dream*

[120] *We struggle in this milieu of desocialized connection without institutional capabilities developed to failsafe rather than exploit the distance between sentience and world, a fissure that in other eras was healed by varied institutionalizations of "truth," "trust," "witness," "accountability," "responsibility," "fact," "fidelity," and "meaning." In some cases, these capabilities have been actively damaged or weakened, as in the destruction of the news industry and the democratic role of the Fourth Estate. In other cases, such capabilities, and the institutions to enact them, have not yet been developed, as illustrated in the many varieties of epistemic rights violations from location-data trafficking to the international shipping crisis of fake GPS coordinates that facilitates criminality at sea. New rights that are essential but still uncodified are mirrored by new and still nameless crimes.*
Shoshana Zuboff, "Surveillance Capitalism or Democracy? The Death Match of Institutional Orders and the Politics of Knowledge in Our Information Civilization," Organization Theory 3, no. 3 (July 1, 2022): 26317877221129290, https://doi.org/10.1177/26317877221129290.

[121] Zuboff, "Surveillance Capitalism or Democracy?".

[122] Cf. Yann LeCun, "Self-Supervised Learning: The Dark Matter of Intelligence," *Facebook AI Blog*, October 2021, https://ai.facebook.com/blog/self-supervised-learning-the-dark-matter-of-intelligence/

reflect this conceptual extension, implying that depth is not merely a metaphor but is crucial for understanding the type of these processes. Unsurprisingly, that invites the methodological philosophies of depth, with LLMs being psychoanalytically labelled as the synthetic unconscious of humanity reflecting out hidden-latent desires, biases, cruelties and longings represented in the weights of AI models.[123]

However, this chapter proposes that the key to understanding latency in generative models is not that it is deep, hidden, secret, or unintelligible. The equally dangerous trajectory would be to perceive it as a space of *virtual* possibilities. Latent space in generative models is composed of vectors derived from token embeddings—numerical representations that capture features of the input data. These embeddings vary depending on the type of data: for text, they encode semantic and syntactic relationships between tokens; for audio, they represent phonetic, rhythmic, and tonal characteristics; and for images, they capture spatial, colour, and texture-based information.[124] In the initial stages of that process called tokenisation, raw, continuous data is segmented into discrete units—whether words, phonemes, or pixel patches—which are then mapped to embeddings. These transformations create the latent space, a multi-dimensional, compressed *representation* of the relationships between features in the data. Each dimension of this space corresponds to specific learnt characteristics, allowing the model to organise, manipulate, and generate outputs by recombining those patterns and dependencies.[125] Latent space functions as the model's internal map of understanding, enabling it to generate meaningful outputs by recombining patterns and dependencies from tokenised inputs.

The structure of relationship between all those subsequent layers is not that of depth, as that would suggest some accessible surface and a hidden space beneath. Instead, the architecture of AI models is better understood as a multidimensional framework of layers. Each layer in a neural system can be thought of as performing a topological

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[123] Cf. Luca and M. Possati, "Algorithmic Unconscious: Why Psychoanalysis Helps in Understanding AI," *Palgrave Communications* 6, no. 1 (April 24, 2020): 70, https://doi.org/10.1057/s41599-020-0445-0.

[124] Aditya Ramesh, Mikhail Pavlov, Gabriel Goh, Scott Gray, Chelsea Voss, Alec Radford, Mark Chen, and Ilya Sutskever. "Zero-Shot Text-to-Image Generation." *arXiv* preprint, January 2021. https://arxiv.org/abs/2102.12092.

[125] Ashish Vaswani, Noam Shazeer, Niki Parmar, Jakob Uszkoreit, Llion Jones, Aidan N. Gomez, Łukasz Kaiser, and Illia Polosukhin. "Attention Is All You Need." *Advances in Neural Information Processing Systems* 30 (2017): 5998–6008. https://arxiv.org/abs/1706.03762;

transformation on the data, reshaping it into different representations across various dimensions. These transformations act as mappings from one configuration of the data to another, rather than layers of depth. Layers process information sequentially (though some advanced architectures process in parallel), building abstract representations by combining patterns from previous layers.

Early study for *Leave Britney Alone*, 2022

FIGURE 1.10A: Still from an animated simulation of an early model for *Leave Britney Alone*.

The possibilities of data folding and utilising it as material were explored in a series of experiments titled *Leave Britney Alone*.[126] The initial dataset consisted of images scraped from Google image searches of the phrase "Leave Britney Alone," and related prompts, a reference to the viral 2007 video and meme. Over several months, the collected images were organised into clusters using t-SNE, with thematic similarity established based on the image caption metadata. The dataset was explored in dynamic simulated environments (Figs. 1.10A and 1.10B) and assembled into as a sculpture (Figure 1.11).

Those various logics of data folding demonstrate that the rhetoric of representation, though commonly applied to AI processes, philosophically mischaracterises the sequential dynamics at play in AI generators. Data is not extracted from reality in a neut-

[126] Know Your Meme. "Leave Britney Alone." *KnowYourMeme.com*. https://knowyourmeme.com/memes/leave-britney-alone

Study for *Leave Britney Alone*, 2022

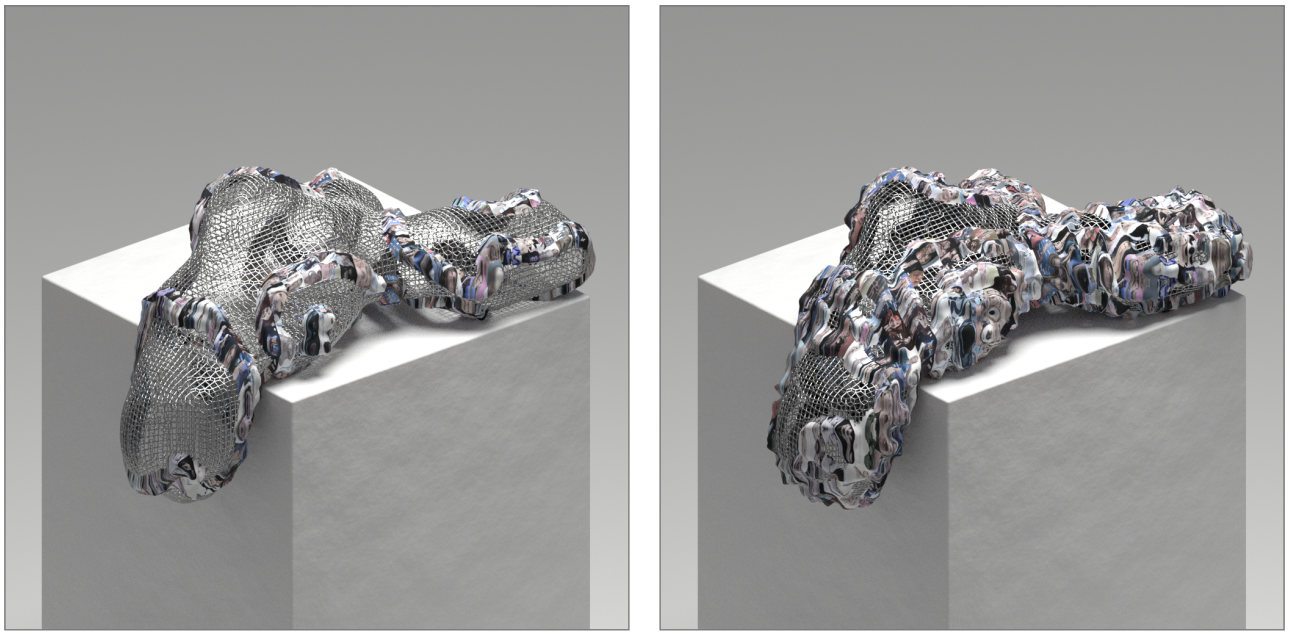

FIGURE 1.10B: A generative study for *Leave Britney Alone*.

In later iterations, the sculptures were generated using a reaction-diffusion system, a mathematical model that simulates the interaction of substances diffusing across a surface, resulting in organic, self-emergent patterns. The initial dataset, organised using t-SNE clustering, was augmented with synthesised data variations that preserved the thematic structure derived from the caption metadata. These augmented datasets were used as inputs to parameterize the reaction-diffusion algorithm, controlling the diffusion rates and reaction coefficients to influence the formation of clusters and growth patterns on the mesh. The reaction-diffusion system was implemented through custom shaders and scripts in Blender, allowing the synthetic data to dictate the directional flow and concentration gradients. This process enabled the clustered structures to emerge based on the original image dataset, while unpredictable growth was made possible through the reaction-diffusion process.

The underlying mesh, on which the forms grow, was derived from an earlier phase of the project, maintaining a connection to the initial dataset. While the surface grid follows a somewhat regular pattern, the overall organic shape of the mesh was influenced by thematic attractors embedded within. These attractors, based on clusters formed during the t-SNE analysis of the image data, guided the sculptural form by embedding points of thematic tension directly into the mesh. This allowed the reaction-diffusion process to respond not only to the surface topology but also to these data-driven attractors, subtly shaping the distribution of growth patterns and reinforcing the connection between the evolving structures and the original dataset.

Leave Britney Alone, 2022

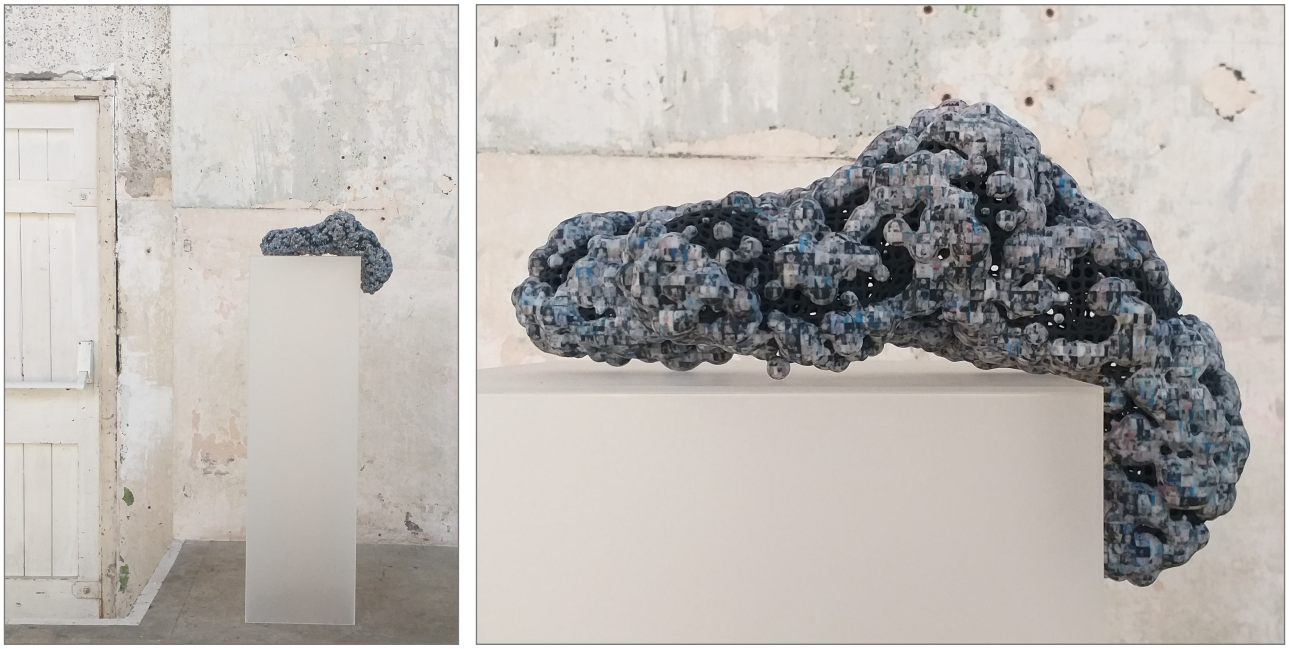

FIGURE 1.11: The exhibition view (left) and close-up photograph (right) of the plaster powder 3D-printed sculpture.

ral, "innocent" way, nor does it serve as a straightforward copy of it. Instead, data is *produced* based on selective interactions with reality, shaped by the logic of data collecting-grasping itself. Far from being a transparent reflection of the world, data emerges through a series of selective decisions that prioritise certain dependencies, perspectives, and interpretations. It is a product of entangled processes, revealing specific facets of reality, while occluding others, thus generating small coherences within a broader field of possibility. In this sense, this thesis argues, data, and consequently, latent space, is less a mirror of reality and more a *perspectival construction* conditioned and moulded by the priorities of the system that organises it.

Consequently, the same applies to the generative models – the process within a neural network—from data to tokens to embeddings—is not a direct *representation* of data but a series of selective transformations, as observed in the experiment. While the model learns from patterns in the data, there are also *prior structures* and *biases* embedded in its architecture, loss functions, and optimisation process that shape what it prioritises.

It is crucial to analyse AI hallucinations in this context. Hallucinations in AI, particularly large language models (LLMs), occur when models generate outputs that, while coherent, fail to correspond to reality. These hallucinations arise from the model's reliance on probabilistic patterns derived from extensive training data. When presented

with ambiguous or succinct input, the model extrapolates based on statistical associations, optimising for coherence rather than alignment with real-world events. As a result, the generated outputs, though logically plausible, diverge from the actual information.[127]

This section proposes that, rather than interpreting hallucinations as failures of the model, they can be seen as *counterfactuals*—not errors but mere reconfigurations conditioned by the model's learnt data patterns.[128] While overfitting reflects the model's failure to generalise—adhering too closely to the training data—hallucinations arise because the model's exemplary generalisation — extrapolation beyond immediate inputs by drawing on learned patterns.

These hallucinations arise as the model navigates its topological landscape, exploring new configurations of the data space. Each hallucinated output reflects the system's capacity to recombine learnt patterns into coherent alternatives, which, though they diverge from factual events, remain plausible within the model's internal logic. In that sense, hallucinations truly are alternative data realities.

However, relying on counterfactual reasoning, AI constrains the potential for radical novelty. The logic of counterfactuals is bound by pre-existing relationships, allowing for plausible, but not transformative, outcomes. Thus, hallucinations are not radically new creations but rather plausible reconfigurations that remain tethered to the learnt data.

It seems to be analytically tempting here to analyse the relationship between the latent space and the outputs of generative AI models in terms of Deleuzian virtuality and actualisation. In the Deleuzian framework, the virtual is not a metaphysical entity but rather a mouldable potentiality that affects and is affected. In this sense, the virtual differs from *the possible* that represents a transcendental category constrained.[129] For Deleuze, the possible implies a potential realisation of something already limited through the conditions of the real, while the virtual is a dynamic field of potentiality

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[127] Zhehui Ji, Nayeon Lee, Rita Frieske, Dan Su, Yan Xu, Ewa Kocańda, and Heng Ji. "Survey of Hallucination in Natural Language Generation." *ACM Computing Surveys* 55, no. 12 (2023): 1–38. https://doi.org/10.1145/3571730.

[128] Counterfactuals are meant here in the Lewis' understanding: David Lewis, *Counterfactuals.* (Cambridge, MA: Harvard University Press, 1973).

[129] Gilles Deleuze, *Difference and Repetition,* Translated by Paul Patton. (New York: Columbia University Press, 1994).

generating new and unforeseen actualisations.[130] Crucially, actualisation of the virtual is a process of meaning-making through difference. In that sense, the notion of the virtual in Deleuze is strictly related to that non relational difference — it is not difference *from*, it is rather a force of differentiation — a collapse of potentialities and generation of new ones.[131]

> "Difference is not diversity. Difference is not even contrary opposition. It is much deeper: it concerns the genesis of diversity and opposition itself. Difference is this state in which determination takes form."[132]

However, as Mattia Paganelli rightly notices, Deleuzian virtual despite being immanent to reality, in its logic remains pre-material and pre-individual. It is a real field of potentiality that does not seem to have any relationship to time. Paganelli questions Deleuzian take on the possible and proposes that, contrary to Deleuzian reading of it, the systemic possible emerges from the material conditions specific to a system and its irreversible dynamics.[133] Unlike an abstract reserve of potential, the possible is constructed through the internal coherence and interactions of a finite system, conditioned by its genealogical, material, and temporal constraints.

This thesis proposes that the strange ontology of possibility and the relationship between the latent space and outputs of the synthetic systems could be grasped through the tension between Paganelli's and Deleuzian framework. Paganelli is right about the anatomy and symmetries of the systemic possible, however, that possibility

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[130] *The virtual is opposed not to the real but to the actual. The virtual is fully real in so far as it is virtual. Exactly the same is true of the possible in relation to the real: the possible is opposed to the real; the process undergone by the possible is therefore one of realization. By contrast, the process undergone by the virtual is one of actualization.*
Deleuze, *Difference and Repetition*, 208.

[131] In that sense, it builds on the Bergsonian idea of memory that exists in the virtual, coexisting with the present and influencing the actual as well as Simondonian individuation. Similarly to Deleuzian actualisation, Simondonian individuation is the ongoing process through which an individual emerges by resolving tensions within a metastable, pre-individual state. Through *transduction*, the individual evolves in constant interaction with its environment.
Matt Bluemink, "On Virtuality: Deleuze, Bergson, Simondon," *Epoché Magazine*, no. 36 December (December 10, 2020), epochemagazine.org/36/on-virtuality-deleuze-bergson-simondon/.

[132] Gilles Deleuze, *The Logic of Sense*, trans. Mark Lester (New York: Columbia University Press, 1990), 170.

[133] Mattia Paganelli, "Finitude, Possibility, Dimensionality: Aesthetics after Complexity" (Birmingham City University, 2016).

within the space of AI generators becomes radically constrained. This is not an ontological inevitability but rather a design feature that makes their processes largely reversible, partially indifferent to the material conditions and non-local. In that understanding, AI meanings are closer to Deleuzian virtuality — real but not yet differentiated into actuality. However, the difference between Deleuzian virtualities and AIs latent space is that the geometric regularities of the latter, produced through the model's interaction with data, are already actualised, material entities, *generating* new entities through stochastic processes.[134]

Popular AI generators are not designed to seek new logics of cohesion, but rather to produce plausible results. While algorithmic processes and AI are often associated with a crisis of authenticity, Nidesh Lawtoo observes an opposite tendency in politics, which contributes to the contemporary rise of new fascism. His work presents authenticity as performative and mimetic, with figures like Donald Trump embodying mimesis—imitation, repetition, and emotional resonance—rather than factual alignment. According to Lawtoo's notion of *homo mimeticus*, political movements are driven by emotional contagion and imitation, with Trump tapping into mimetic resonance with his audiences. Lawtoo underscores that perception of authenticity, sustained by emotional intensity, endures even amid falsehoods, functioning as a populist trope that privileges emotional alignment and simplicity over intellectual nuance or factual accuracy.[135]

Therefore, in fascist circulation, the truthfulness of something becomes to some extent irrelevant, as its power is not rooted in (in)accuracy of representation. This understanding highlights the real danger posed by deepfakes, deepnudes, fake news, conspiracy theories, and AI agents faking sentience—they operate based on intensities

[134] The lack of mystery is emphasised here as a response to blackboxing of AI models.

[135] Nidesh Lawtoo, *(New) Fascism: Contagion, Community, Myth*, 1st edition (Michigan State University Press, 2019).

and truth-feeling. The danger posed by deepfake content lies not merely in its falsity but in the slickness, aesthetic appeal and temporary agency of *simulacra* it creates.[136]

Following from that, this chapter proposes that AI in its current form does not necessarily contribute to the crisis of authenticity but a crisis of fabulation, or what Walter Benjamin describes as storytelling. Benjamin distinguishes between storytelling and information, stating that information as a form of knowledge is defined by its immediacy, factuality, and lack of depth, while storytelling offers a form of counsel linked to the lived experience. That does not mean a piece of concrete advice or consolation. Rather, Benjamin emphasises ambiguity that characterises storytelling that never exhausts its meaning:

> "Indeed, good counsel is less an answer to a question than a suggestion of how to continue a story (that is already in progress). (…) Counsel, woven into the fabric of real life, is wisdom. The art of storytelling is reaching its end because the epic side of truth, wisdom, is dying out."[137]

In Benjamin's conception, storytelling is characterised by its capacity to initiate an exploratory process of meaning-making – one that resists closure.This chapter does not draw a direct equivalence between AI outputs and the logic of information as described by Benjamin, but rather argues that AI generators, in their current popular configuration as content production services, limit the potential for creative experimentation, both processually and materially. Benjamin suggests that storytelling thrives on the ability to "continue a story," encouraging interpretative openness. In contrast, AI systems, particularly those relying on conversational, prompt-based interfaces, privilege clarity and strict adherence to training data. By prioritising the avoidance of hallucinations, these systems confine creativity to a narrow, architecturally predetermined path, diminishing the potential of material exploration that storytelling

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[136] A good example here is AI-powered apps such as Clothoff, which non-consensually merges women's faces with generated sexualised bodies, and DignifAI, which "puts clothes on [photos of] degenerate" women, removing tattoos and piercings, and adding aprons or babies. These tools reinforce deeply misogynistic narratives. Their impact matters not only because viewers might mistakenly believe the images are real, but because, in cultures where female sexuality is considered shameful, such synthetic assemblages generate instantaneous ridicule, regardless of their truthfulness.

[137] Walter Benjamin, *The Storyteller: Reflections on the Works of Nikolai Leskov*, in *Illuminations*, ed. Hannah Arendt, trans. Harry Zohn (New York: Schocken Books, 1968), 86.

embodies. Because the outputs are familiar, counterfactual in their most creative activity, they do not tend to encourage the new logics of systemic folding.

Lyotard, citing Braque, said that truth "has no opposite", and therefore both truth and deception are manifestations of the internal consistency of a system.[138] He claimed that the impossible topos of truth "makes itself felt on the surface of discourse through effects, and this presence of meaning is called expression. However, not all expression is truth."[139] For Lyotard, the only distinction worth making was between forms of expression: "the one that exists to thwart the gaze (to capture it) and the one that is there to expand it, to allow it to see the invisible". That expanding force of poietic expression is what Lyotard called the *figural*, and Benjamin called *wisdom*.[140]

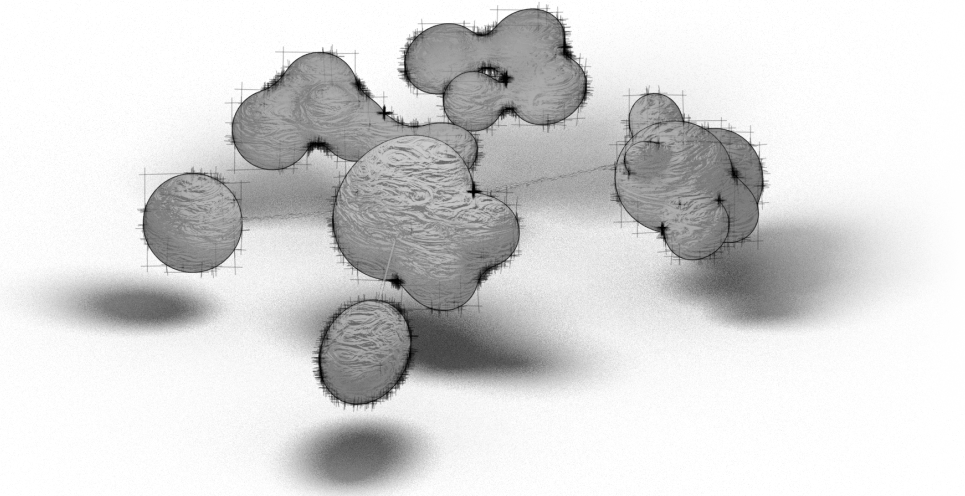
[138] Jean-François Lyotard, Antony Hudek, and Mary Lydon, *Discourse, Figure*, Illustrated edition (Minneapolis Minn.: University of Minnesota Press, 2019).

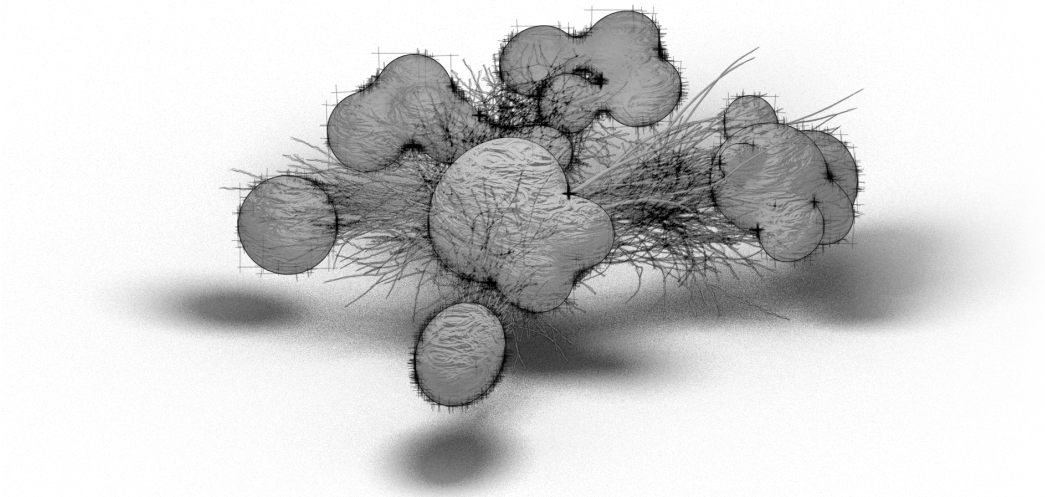
[139] Ibid.

[140] Benjamin, *The Storyteller Essays,* and Lyotard, Hudek, and Lydon, *Discourse, Figure*.

Chapter 2

The Book of Clouds: mood, trauma and synthetic readymades





Introduction

(…)
Under the night, somewhere
between the white that is nothing so much as
blue, and the black that is, finally; nothing,
I am the man neither of you remembers.
Shielding, in the half-dark,
the blue eyes I sometimes forget
I don't have. Pulling my own stoop-
shouldered kind of blues across paper.
Apparently misinformed about the rumored
stuff of dreams: everywhere I inquired,
I was told look for blue.

Blue, Carl Phillips

Chapter 1 began assembling an image of synthetic circulation in which intensities, whether of attraction, violence, or counsel, operate as primary sites of meaning-making, onto-epistemologically generative across both digital and non-digital terrains. It traced how meaning mutates through hybrid systems composed of human actions, algorithmic operations, semi-autonomous simulacra detached from their original contexts, bots, and AI models—systems in which distinctions between the human, the digital, and the virtual persist, but no longer suffice to grasp the heterogeneous and distributed body through which meaning is now produced. While this investigation captures certain aspects of these new epistemological dynamics, it does not fully address how such only partially compossible systems undergo non-local transformation, how change occurs without stable forms of identity, coherence, or unified direction.

This chapter argues that the notion of *mood* provides a way to approach both local and non-local transformation across complex multimodal systems that are neither ontologically aligned nor sensorially translatable into one another. It does so without reducing their behaviour to component sums, fundamental laws, or attributing change solely to external intervention. Rather than describing a psychological state or shared affect, mood is constructed and proposed here as a mode expressed across one or multiple systems as a tensor field — a distributed agentic or topological orientation through which otherwise incompatible elements come to belong together.

The first section, *Patterns of Mattering: Mood as Orientedness of Matter*, draws on Heidegger's *"mattering-to"* and *attunement*, Golding's reading of the *return of difference*, and insights from dynamical systems theory to redefine mood as a distributed "turning," rather than a collective psychological filter imposed upon an external reality.[1] Here, mood provides a way to articulate systemic belonging and transformation without relativisation—how perpetually changing (morphing) entities are connecting meaningfully within a world already in motion, where everything is inherently connected.

The second section, *Laws of Attunement: The Emergent Order of Timbral Cohesions*, further explores the dynamics of this "turning," using attunement to reframe questions of systemic alignment and rupture beyond the dialectics of individualism and collectivism, consonance and dissonance.

The third section, *Physics of Trauma: In the Wake of Witnessing*, considers how mood may allow for an understanding of enduring vectors of oppression that persist despite historical or legal shifts. It approaches trauma and oppressive atmospheres not through metaphorical, psychoanalytic or metaphysical interpretation, but as systemic and material patterns that remain active within the present.

Using the developed philosophical framework, the fourth section, *AI Archives: Aesthetics of Re-Assembly and the Emergent Bias of a Synthetic Canon*, extends the earlier discussions by exploring how mood can illuminate the embedded biases present in contemporary generative AI infrastructures. It considers mood not just as a feature of output or perception but as an operative force within the stochastic processes of meaning production and latent patterning that undergird synthetic generation. This ap-

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[1] Martin Heidegger and Dennis J. Schmidt, *Being and Time: A Revised Edition of the Stambaugh Translation*, trans. Joan Stambaugh, Revised edition (Albany: State University of New York Press, 2010), 341,

See also: Golding, Johnny, 'Ana-Materialism & the Pineal Eye: Becoming Mouth-Breast Visual Arts in the Age of Algorithmic Reproduction | Leonardo Electronic Almanac', accessed 22 April 2020, http://journals.gold.ac.uk/index.php/lea/article/view/49,

See also: Adam Levy, 'Equilibria in Dynamical Systems: Iteration Mappings, Attractors, and Basins of Attraction', 2018, 23–31, https://doi.org/10.1007/978-3-030-04049-9_3.

proach provides an original lens through which to assess how these systems reproduce biases, and how the aesthetic form of generative outputs—when understood through the framework of mood—can reveal emergent, systemic tendencies in the construction of meaning.

2.1. Patterns of mattering: mood as orientedness of matter

i. The shape of feedback: the anatomy of a turn-ing

To understand the move made in this chapter, mood should be approached as a systemic mode rather than a psychological state attributed to an individual agent — in other words, as something distributed. Heidegger's lesser-known work on mood, which nonetheless remains integral to his phenomenology, proves helpful here. Heidegger captures the ontological gravity of mood, denying its auxiliary, subjective or psychological role: "We emphasized the fact that whereas moods are ontically familiar, they are not cognized in their primordial and existential function. They are [wrongly] taken as fleeting experiences that "color" one's whole "psychical condition." (…)".[2] In Hedeiggerian understanding, the mood neither *belongs* to a singular or collective body and their experience of the world, nor is produced by it, but, rather, is an aspect of ontological belonging, being-there (*Da-sein).* The word "aspect", however, is not analytically rigorous enough, as it could be easily replaced by a "feature" or … "mood", which would lead to a tautological assertion that mood is a mood of ontological belonging.

Befindlichkeit, *Geworfenheit*, and more relevantly, *Stimmung*, and *Gestimmtheit* translated respectively as disposedness, thrownness, mood and attunement, describe the features of simultaneity of already-being-there that collapses the ontological discontinuity between being and the world of beings, or being and Being, to put it in the Heideggerian terms.[3] In line with Heideggerian phenomenology, it reflects a plural movement of both grasping the 'out-there' and being grasped by it simultaneously, a dynamic expressed in Heidegger's later work as a principle of identity: A=A.[4] That does not mean that *A=A* gets rid of difference, or dissolves any differentiation into some totalising or uniform milieu.

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[2] Martin Heidegger and Dennis J. Schmidt, *Being and Time: A Revised Edition of the Stambaugh Translation*, trans. Joan Stambaugh, Revised edition (Albany: State University of New York Press, 2010), 341.

[3] Jan Slaby, 'DISPOSEDNESS/BEFINDLICHKEIT (Heidegger Lexicon)', 2020.

[4] That principle was already discussed in chapter 1 in the context of of Johnny Golding's work. Martin Heidegger, *Identity and Difference*, trans. Joan Stambaugh, 2nd edition (Chicago: University of Chicago Press, 2002).

> "Mood assails. It comes neither from 'without' nor from 'within', but rises from being-in-the-world itself as a mode of that being. […] Mood has always already disclosed being-in-the-world as a whole and first makes possible directing oneself toward something. Being attuned is not initially related to something psychical, it is itself not an inner condition which then in some mysterious way reaches out and leaves its mark on things and persons."[5]

In this sense, mood is not merely a marker of ontological affiliation; it is the ontological distribution itself, the shaping principle that gives form to it. If the a priori division of an agent and its environment is collapsed and replaced by the materiality already disclosed (disposedness, thrownness) arising (self-assembling), as a consequence of being-in-the-world, then the twofold move of mood-attunement starts playing an important role in the *differentiation* of being — the "mattering to".

> "This mattering to it is grounded in attunement, and as attunement it has disclosed the world, for example, as something by which it can be threatened. Only something which is the attunement of fearing, or fearlessness, can discover things at hand in the surrounding world as being threatening. The moodedness of attunement constitutes existentially the openness to world of Da-sein."[6]

For Heidegger, mood (*Stimmung*) is the concrete manner in which attunement is realised: it is how Being is tuned into a specific orientation, disclosing the world as mattering in particular ways. His play with the root word *stimmen* captures this operative mode: tuning up, turning against, or voting—each implying a reconfiguration of relations that sets direction and intensity. In this reading, attunement can be understood as a turning in which Being distributes itself.[7]

Golding reframes this Heideggerian move in systemic terms, as an encounter of embodied exchange in which meaning is perpetually emergent through thickening feedback loops. She focuses on the equals sign in $A = A$ and proposes that it marks movement by functioning as a feedback loop — a return. Like Deleuze — who, following Nietzsche, understands cohesion as arising from the ontological re-turn of difference

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[5] Heidegger et al, *Being and Time,* 137.

[6] Heidegger et al, *Being and Time*, 137.

[7] Gerhard Thonhauser, "Beyond Mood and Atmosphere: a Conceptual History of the Term *Stimmung*". *Philosophia* 49, 1247–1265 (2021). https://doi.org/10.1007/s11406-020-00290-7

— Golding emphasises that what returns is not similarity but difference. This return produces a recursive thickening in the system's topology, a textured irregularity or 'roughness' found in the Mandelbrot set, where uneven iterations break the tautology of a simple return and open the loop to new topological formations: $Z_{n+1} \rightleftharpoons Z_N^2 + C$, where:

Z_{n+1} is the evolving state of the system, capturing each new position in the complex plane. Each iteration pushes the system forward, determining whether it remains stable or diverges,

$\rightleftharpoons$ marks a dynamic feedback within the system rather than a one-way progression. It marks the "re" or return. This suggests a continuous interaction with prior states as the system evolves,

Z_N^2 the squaring function transforms Z with each iteration, creating recursive patterns and internal symmetry. It reflects the inherent tension within the system—expanding and rotating each state while maintaining systemic coherence,

C acts as a fixed "parameter" that anchors the system's behaviour. The stability or divergence of the entire sequence hinges on this constant, making c the defining element of the system's long-term behaviour.

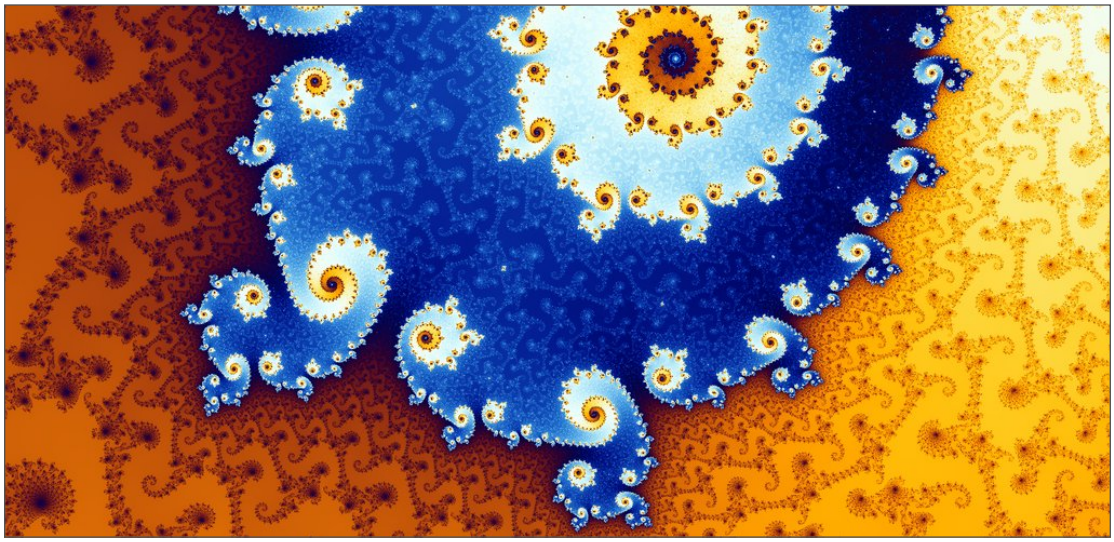

FIGURE 2.1: Rendered Mandelbrot set, 16 steps.
e-mc3 (DeviantArt), October 13, 2008, deviantart.com/e-mc3/art/Mandelbrot-set-Step-16-100663910.

The fractal pattern expresses how the return of difference distributes itself across the system, generating textured irregularities — what Golding, drawing on Mandelbrot, characterises as 'roughness'. Each iteration transforms the previous state without col-

lapsing it into sameness, producing a recursive structure in which coherence emerges through variation. It is the unevenness of looping that creates new topologies.[8]

While Golding uses the Mandelbrot set to think the return of difference as an ontologically generative moment, this thesis draws from the same image to propose a different emphasis: the "turn" within re-turn as a systemic mode of reorientation. In this reading, each iteration in the Mandelbrot process can be imagined as an arrow that does not retrace its path (simply adding variation) but bends into a new direction, altering the orientation of the whole configuration. At certain thresholds, these turns do more than redirect existing trajectories: they open into new dimensions or topologies, changing the very space in which the system moves. In such an image, identity is not a basis of association but a temporary effect of participating in the same movement, emerging and dissolving within the ongoing field of reorientation.

That would include acknowledging motion as the ontological basis of being, being as moving-together-with[9].

The points, lines, and planes that mark the shape of oscillatory repetitions should not be imagined as measurement values that map or envelope the movement, but as

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[8] Johnny Golding, "The Courage to Matter." *Data Loam: Sometimes Hard, Usually Soft (the Future of Knowledge Systems)*, (Boston: De Gruyter, 2020).

[9] It is crucial to distinguish this argument from other propositions of kinetic materialisms. The most notable take on ontology of motion in recent years has been presented by Thomas Nail. Following ancient poet Lucretius, Nail establishes motion not as a feature of matter but its primary constitution. The key to matter's individuation in his work is the notion of a fold (after Lucretius' plex) that serves as an analytical proof of matter's continuity.

"Folds occur only in that which is continuous. This is because a fold is defined by the curving or bending of something back over itself. The intersection or junction of a flow with another flow is not a fold, but an encounter or event. The first is capable of producing recurring cycles [iuncta] and periods [nexus], while the second is fleeting and singular [eventa]. If being were not continuous there could be no folds or even events, only isolated, vacuum-sealed fragments. Folding presupposes continuity, and continuity makes possible the fold of being. Discreteness is thus only the product of a more primary process of flows which have folded into seemingly discrete things."

In Nail's work discreteness and illusion of graspable stasis get produced through folding of matter. The folding gives rise to the void and to the formation of a thing:

"When a continuous flow folds over itself it produces the discrete inside and outside that defines the thing."

Above quotes from: Thomas Nail, "The Folds of Matter", *Lucretius I: An Ontology of Motion* (Edinburgh: Edinburgh University Press, 2018), 120-135.

points, curves, and manifolds of reflection (repulsion) or attraction. They are best understood as attractors and repellers *for* the flow of matter. At this point, one might suspect the risk of slipping into a dynamic or localised teleology, in which the global arrangement of attractors determines and shapes the inert motion of matter. Golding's dynamic reading of the already discussed Heideggerian $A = A$ as a plural moment-time of exchange prevents such a slide, because, ontologically, attraction can never be a one-sided move.

It is important not to take attractors in the colloquial sense of external motivators of a system. Here, an attractor is defined in its physical sense, as a fragment of the phase space of a given dynamical system, and therefore as part of the system and of its movement.[10] Crucially, attraction does not cause movement but is movement *towards-with*. The mode of this movement — the emergent field/shape of turning-on-towards — is here called mood.[11]

The logic of primacy of continuous motion is best articulated in Thomas Nail's work. Nail, following Greek philosopher Zeno, demonstrates the logic of the twofold continuity-movement condition as the ontological base of being:

> "We can say there is a "change" that occurs since an entity is now at point A, now at point B; it changes from point A to point B. However, if there is no continuity between points A and B, then these points are not different aspects of the same movement but, rather, radically different points without any movement between them at all. Movement without continuity is thus not movement at all but merely discontinuous, formal, or logical change."[12]

As a result, a re-turn-to is a continuous shift in the direction of material flow, which may or may not follow cycles or periodic patterns. Continuity here is independent of periodicity, which no longer defines its identity. This connection is not grounded in cohesion through similarity, sameness, or even difference; any apparent similarity is understood not as an ontological property but as a property of motion. Two entities may turn/orient differently yet, through their movement, participate in creating the same figure, a topology drawn collectively through their ongoing motion.

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[10] Morris W. Hirsch, "The chaos of dynamical systems." In *Chaos, fractals, and dynamics*, (CRC Press, 2020) 189-196.

[11] The differentiation between those is introduced in the later sections.

[12] Thomas Neil, *Lucretius I: An Ontology of Motion* (Edinburgh: Edinburgh University Press, 2018).

ii Against homophily: agential edging of "the masses"

This systemic image on mood might not immediately reveal its political immediacy and gravity in the context of exclusionary behaviour or other pathological systemic logics. However, the modelling and design of political mood shifts have been part of political reality, as highlighted by the controversy surrounding Cambridge Analytica.[13]

Wendy Chun examines how commonsensical assumptions and images of thought exert prescriptive power within algorithmic social modelling. She exposes them in her research into homophily acknowledged as a driving principle of applied network science. Chun reveals the history and foundations of methodological oversimplification, unethically obtained data, circular logics hidden in analytical tools and commonsensical "wisdom" folded into social modelling.[14] Homophily is the sociological assumption that shared identity, or more broadly patterns of similarity, cause social connections and the clustering of "the masses". This claim — that people bond best with those like themselves — is not only empirically contestable but also socially harmful. Under the disguise of a platitude — a seemingly innocent commonsensical assertion, the concept of homophily acts in a double-edged manner: discovering-inventing similarity at the heart of ontological clustering. In this way, it is possible to polarise politically ambivalent groups into segregated neighbourhoods. Through homophilic statements, and according to political need, iterated media messages construct a narrow, immovable category of belonging that appears naturally grassroots, yet is in fact systemically reinforced. Chun uses an analogy of a ferromagnet to describe the change of political ori-

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[13] Frank M. Shipman and Catherine C. Marshall. "Ownership, Privacy, and Control in the Wake of Cambridge Analytica: The Relationship between Attitudes and Awareness." In *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems, CHI '20*, 1–12. New York, NY: Association for Computing Machinery, 2020.

[14] *Homophily structures networks by creating clusters; in doing so, it makes them searchable and predictable. But, more important, as a "commonsense" concept that slips between cause and effect, homophily assumes and creates segregation. It transforms individuals into "neighbors" who naturally want to live with people "like them"; it introduces normativity within a supposedly nonnormative system by presuming that consensus stems from similarity; and it makes segregation the default. In valorizing "voluntary" actions, it erases historical contingencies, institutional discrimination, and economic realities. At its worst, it serves to justify the inequality it maps, by relabeling hate as "love."*
Wendy Hui and Kyong Chun, *Discriminating Data: Correlation, Neighborhoods, and the New Politics of Recognition* (Cambridge, Massachusetts: MIT Press, 2021), 96.

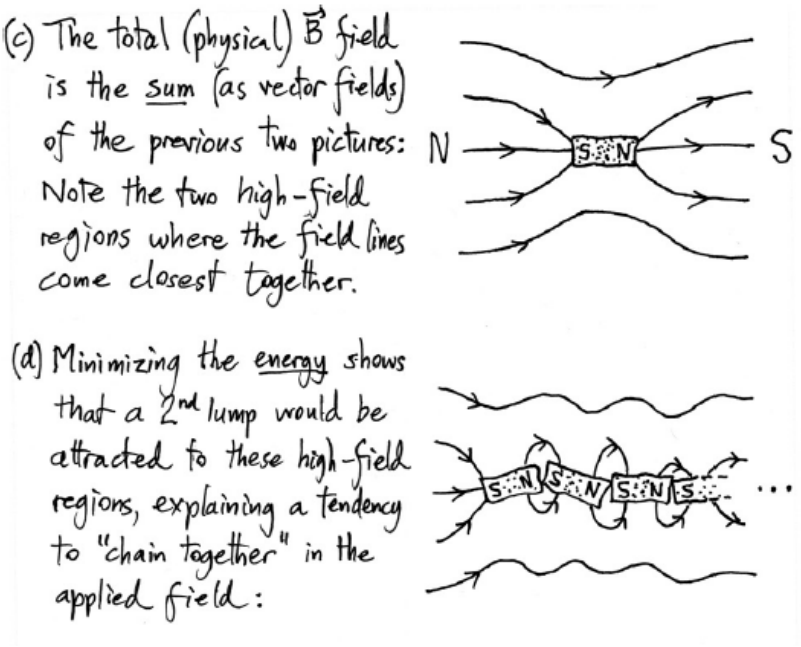

FIGURE 2.2: "Magnetic Polarisation" from "Homophily, or the swarming of the segregated neighbourhood" in Wendy Chun's *Discriminating Data*.

entation of the previously ambiguous group: "the masses" behave like ferromagnetic lumps — iron filings exposed to an applied field. The applied field represents here a targeted media campaign that results in forms of political position, often formulated in a dialectical way.[15]

The ferromagnetic theory of political polarisation offers a persuasive image, however, it suggests that the polarisation must be a result of an intervention — some externally applied field. That perfectly fits some modes of fascistic propaganda from the 1930s with a coherent message and a plan executed by appointed individuals in an increasingly controlled social system.

However, the formation and shifts of political moods in an era of accelerated content production, circulation, mutation, and expiration call for an image capable of accounting for (1) the non-cognitive agency of uncontrollable meaning pairings discussed in Chapter 1, and (2) the multidimensional orientedness and positional fluctuations of systemic agents. It is the turning of the iron filings, rather than their eventual stabilised arrangement, that proves consequential for understanding political moods. Accordingly, this investigation focuses on political mood-turning and tuning — for example, a

[15] Ibid.

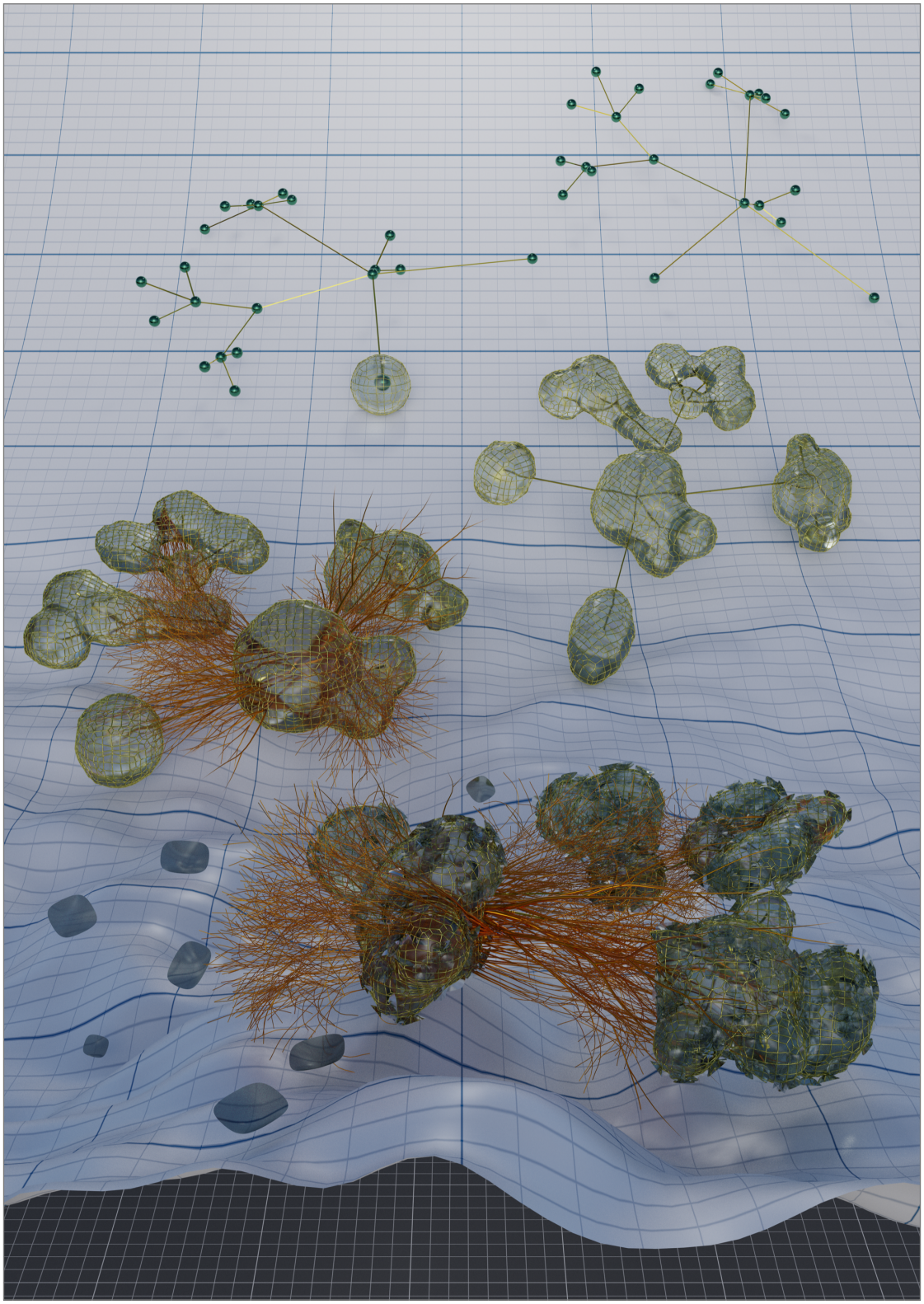

FIGURE 2.3: 4-dimensional graph of emergent mood.

The proposed image results from an experimental simulation using multiple datasets that evolved and fragmented according to predefined dynamic parameters. It reconfigures the formalism of graph theory by altering the roles of edges, vertices, and the assumed neutrality of background space. The simulation expresses increasing edge complexity (visualised as copper filaments). In a four-dimensional diagram — three spatial dimensions and one representing change over time — the evolving connections visibly transform the system's topology from within.

fascistic atmosphere — rather than on fascistic rule or the features of historical fascist regimes.

Chun briefly notes network science's appropriation of game theory and graph theory. What is absent from this diagnosis is that the adopted images and instruments — drawn from these fields — are themselves filtered through a commonsensical understanding of agency, connection, and movement. She rightly identifies the epistemologically detrimental reduction required at the first stage of analysing social phenomena.[16] In this framework, individuals are typically represented as vertices, with various relationships and connections depicted as edges. Following this initial abstraction and role assignment, the second stage is shaped by the formalism of network theory, which attends to symmetries, degree and weight distributions, and related metrics.[17]

It is crucial to stress here that a form of selection-abstraction does not necessarily lead to distortion or excessive simplification. Without it, one would encounter the Borgesian problem from "On Exactitude in Science", where the science of cartography becomes so rigorous that only a map of the exact size of the territory meets the criterion of exactness.[18]

It is tempting to fall into the cliché that the inexpressible nature of human relationships and politics cannot be reduced to a network of dots and lines. Using graph theory does indeed risk: (1) promoting a purely horizontal interpretation; (2) reducing 'orientedness' to edge symmetry or asymmetry; (3) oversimplifying relational complexity and direction; (4) overlooking the ethical dimension by clustering victims with oppressors; (5) presuming the mappability of relations; (6) prioritising locality over holistic accountability; (7) restricting access to the whole; (8) theorising global phenomena as mere synthesis; and (9) excluding undecidability and mutation from the image of human relationships. These criticisms are all valid when applied to certain network

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[16] *"Most simply, this stage decides what is a "node," what is an "edge," and how they should be mapped. (…) The second stage is "pure" network theory, for it deals "with formalized aspects of network representations such as degree distributions, closure, communities, etc., and how they relate to each other. In such pure network science, the corresponding theories are mathematical theories of networks."*
Hui and Chun, *Discriminating Data*, 25.

[17] Hui and Chun, *Discriminating Data*.

[18] Jorge Luis Borges, "On Exactitude in Science", *Collected Fictions*, trans. Andrew Hurley (New York, NY: Penguin Books, 1999).

representations of political and technological fields, yet they are not universally binding. Such limitations are not intrinsic to graph theory itself: with the same set of tools, it is possible to reconfigure the initial appropriation of network science to produce an image of thought that retains philosophical subtlety.

Despite the colloquial semantics of the word "edge," in graph theory it does not denote the end or border of an entity but rather the connection between vertices. "Edgelessness" does not imply infinity or a blurred boundary, but instead describes free-floating vertices without edges (connections) that nevertheless remain part of a given graph.[19] When edges are understood as connections rather than as affinities or relations, the formalism of graphs and graph operations offers far more than their commonsensical implementations suggest. Even a modest degree of philosophical attention to these operations reveals an expanded range of thought possibilities. In the image developed here, an edge marks a productive rather than a limiting space, instigating new formations rather than guarding an essential core. Conceiving edges as creative rather than fixed analytically complicates the presumed relationship between graph elements—especially when mapped onto non-Euclidean geometries of space, or when changing, productive connections warp the fabric of spacetime. As edges acquire agential and dimensional "growth," vertices can no longer be treated as static points: their shape, orientation, and dynamics shift to reflect the diversity of individual and collective clusters. This, in turn, unsettles the role division between vertices and edges, which begin to operate within manifolds of feedback loops. Such an image, far more adequate for analysing complex political phenomena such as mood, demonstrates how philosophical sensitivity to the logical materiality of appropriated models can open radically new ways of imagining and grasping.

This image contributes to the assembly of the notion of a dynamic systemic mood-mode, understood as contingent on the transformation of systemic edges. Systemic motion is not merely kinetic, imagined as a trajectory travelling through space in a defined time, but generative — a creative change that actively bends, warps, and folds spacetime. In this light, edging — the self-assemblage of an edge — can be understood as a fractal or cross-phase move, expanding the spacetime of a limit. Here, the meaning of an edge is not defined solely in relational terms by its connected vertices. It can

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[19] Reinhard Diestel, *Graph Theory*, 5th ed. (Berlin: Springer, 2017); Jonathan L. Gross and Jay Yellen, *Graph Theory and Its Applications*, 3rd ed. (Boca Raton, FL: Chapman and Hall/CRC, 2018).

instead operate as a line of flight: an opportunity for movement despite rigidity, or a point of dissonance.

This edging–warping of the spacetime environment is often misread in causal terms — as if multiple entities connect, form a growing bond, and thereby cause the environment to change. Such an interpretation misses the point. The inevitable reciprocity of matter does not negate causality, but the thickening of an edge — its edging, warping, and pulling — is not a temporal sequence of steps. It is the event of emergence: a change *of* the system — its internal restructuring — not merely an event *within* it. In this sense, mood becomes a way to grasp the non-determinism of emergence — the complexity and fractalised undecidability of motion-change — without resorting to any new mysticism of matter as fundamentally unpredictable or spontaneously self-animating.

2.2. Laws of attunement: the emergent order of timbral cohesions

i. The re-turn of a position

The "tuning to," or attunement, aspect of mood in the Heideggerian sense reveals an operation that can be articulated through terminology developed for describing the dynamics of sound. Yet the long-standing reliance on musical metaphors and analogies to express mood has, paradoxically, obscured the specificity of this operation by framing it in aesthetic rather than structural terms. This difficulty is compounded, as Jonathan Sterne notes, by the absence of a robust metalanguage in technical accounts of listening, which reinforces a dependence on metaphor and constrains the precision with which auditory — and, by extension, attunement-related — phenomena can be theorised.[20] Mood is sometimes colloquially likened to the "tone" of an event. This comparison is misleading, as the formalism of tonality allows a tone to be decomposed into constituent parameters. When mood is considered at a large spatiotemporal scale, especially in its broader political dimension, the analogy risks importing a deterministic framing: it recalls the Laplacean demon or the determinism of chaos theory, in which high sensitivity to initial conditions makes long-term behaviour appear unpredictable.[21] Yet such unpredictability is itself premised on the assumption that the system could, in principle, be fully characterised from its initial state. In acoustics, only a pure tone can be expressed as a simple sine wave; a musical tone already requires multiple parameters to define.[22] Likewise, the complexity of mood exceeds what the tone metaphor can convey, whether in physical description or political analysis.

If a musical tone resists complete reduction, timbre is even less amenable to exhaustive definition — and is therefore more suitable as an image-of-thought analogy. Defined as the quality, texture, character, or colour of tone, it is often described through vocabulary borrowed from other sensory domains, requiring definition via synaesthetic analogy. A sound may be called dark, bright, sharp, warm, harsh, aggressive, or airy, frequently by association with non-musical objects and phenomena. In some cases, noise is assigned a "colour" through correspondences between its spectrum and particular

[20] Jonathan Sterne, *The Audible Past: Cultural Origins of Sound Reproduction*, Illustrated edition (Durham: Duke University Press Books, 2003), p. 94.

[21] Pierre-Simon Laplace, *A Philosophical Essay on Probabilities*, trans. Frederick Wilson Truscott and Frederick Lincoln Emory (New York: Dover, 1951), 4.

[22] Ibid.

values in the light spectrum. The tools and conceptual instruments devised to capture timbre often fall into the same traps of philosophical inadequacy as the rhetoric surrounding the politics of mood, oscillating between dichotomies such as objectivity/subjectivity, psychoacoustics/signal measurement, integration/segregation, and the acoustics of an instrument/the acoustics of the space in which it is played. Timbre is sometimes treated as a "wastebasket" category, a provisional repository for all sound qualities not otherwise addressed in a given analysis.[23] Timbre is often approached through its role in distinguishing sound sources of the same loudness and pitch, linked in acoustics to the unique waveform shape of each source.[24] Although commonly analysed through tracing, mapping, and spectral or temporal modelling, such methods echo the methodological difficulties encountered in approaching mood — both are forced into reductive frameworks despite their complexity.

The concern here is the methodological difficulty of defining and dissecting timbre. Approaches that describe it through measurable parameters — spectral components, temporal envelope, and noise patterns — each speak to aspects of its character, yet none capture it in full, nor can timbre be synthesised entirely from these parameters. The same applies to mood, which cannot be fully described or recreated from its constituent "ingredients."[25] One could say that timbre as a feature of tone can be grasped through the combination of certain features of tone, or that timbre is a feature of mul-

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[23] Albert S. S. Bregman, *Auditory Scene Analysis: The Perceptual Organization of Sound*, Revised edition (Cambridge, Mass.: MIT Press, 1994), 92.

[24] Brian C. J. Moore, An Introduction to the Psychology of Hearing, 7th ed. (Leiden: Brill, 2019), 183–85.

[25] When capturing the timbre of a tone in tangible parameters, its spectral frequency components discernible through Fourier transformation are taken into consideration. That results in a spectral distribution that is to some extent timeless, "based on exactly periodic waves of infinite duration".

"Fourier analysis is a timeless description in terms of exactly periodic waves of infinite duration. On the other hand it is our most elementary experience that sound has a time pattern as well as a frequency pattern. . . . A mathematical description is wanted which ab ovo takes account of this duality."

Dennis Gabor, "Acoustical quanta and the theory of hearing," Nature (London) 159 (1947): 591.

Other features contributing to the timbral character correspond to certain dramaturgy of a tone — the time envelope — its attack, sustain, decay and release, which map the sound's dynamic time pattern. There is also never a fully separable pattern of noise shaping the unique auditory textures.

Curtis Roads, The Computer Music Tutorial (MIT Press, 1996), 97.

tiple features of tone. That, as it was demonstrated in the case of mood, leads to tautology. It stops being one if timbre is understood as an emergent parameter-tensor of (vibrational) motion.

Albert Bregman refers to sounds that do not belong to any single environmental object or sound source as "auditory chimaera," after the hybrid mythological creature composed of many distinct parts — the body of a lion, the head of a goat, and the tail of a snake. He makes several observations relevant to timbre and, by extension, to the operation of mood. First, he notes that the perceptual system conducts some of its analyses on larger-scale objects, whose boundaries are established through principles of grouping. In everyday perception, the auditory system groups sounds into a description of their source so that "any emergent properties that arise will be characteristic of that sound source." In contrast, the task of composed music is often the reverse — to group sounds from different instruments and hear this grouping as a single sound with its own emergent properties. From this, Bregman distinguishes two kinds of integration in multipart sound: (1) "actual" fusion, which creates ensemble timbres, and (2) integration that produces constructed "voices" from multiple musical sources, as in orchestral works.[26]

The analytical trap that presents itself here is to wrongly understand emergence (of mood) as a symmetry of summation of any arbitrarily, temporarily or operationally delineated whole — a kind of functional or axiomatic excess/a side effect of a grouping/self-organisation. In this misunderstanding, the emergence of any whole would obliterate any emergent and non-emergent component orders — relative local simplicity would always be functionally subordinated to global complexity or, alternatively, an entity would have to be fractally, infinitely emergent "all the way down" or horizont-

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[26] "*We use the word chimera metaphorically to refer to an image derived as a composition of other images. An example of an auditory chimera would be a heard sentence that was created by the accidental composition of the voices of two persons who just happened to be speaking at the same time. Natural hearing tries to avoid chimeric percepts, but music often tries to create them. It may want the listener to accept the simultaneous roll of the drum, clash of the cymbal, and brief pulse of noise from the woodwinds as a single coherent event with its own striking emergent properties. The sound is chimeric in the sense that it does not belong to any single environmental object."*

Bregman, *Auditory Scene Analysis: The Perceptual Organization of Sound*, 459-460.

ally emergent in a relational sense. That, paradoxically, would be a form of reductionism.

Based on Bregman's analysis, the emergent compositional timbre of a "fictional" sound source is not the product of simple proximity, simultaneity, or sequentiality of grouping, but of a complex topology of cohesion regulated by various logics of "mattering-to." He illustrates this with the example of two different musical works played simultaneously in separate headphones — a combination unlikely to produce the perception of a single musical object or any timbral synchronicity.[27] The discernibility, preservation, and transformation of the timbre of certain constituent components — as when the timbre of a violin is preserved in a "voice" resembling bird sounds within a multipart orchestral composition — demonstrates that emergence does not necessarily erase other organisational principles. In this sense, the successful forms of representation would have to be understood as emergent.

There seem to be two remaining, interrelated problems to solve: the role of perception in cohesive mattering-to and the simultaneous multiple orders of mattering-to (attunement) that could analytically fall into a trap of relativisation of meaning-cohesion.

It would be simplistic to entertain the commonsensical divisions of the objectivity versus subjectivity of timbre (and mood), but that false dichotomy can be easily rephrased using simultaneous orders of cohesion, or material phasing games introduced earlier to formulate certain hypotheses about atmosphere. The reality of something mediated (cohered) by a perception of a sentient being can trace-reflect other material orders, for example, objects being a whole or being physically connected. It can also correspond to things being in some other material relation, for example, that of harmony, dissonance, causal implication or broadly understood material impact. Perception might also create cohesions between unrelated, spatiotemporally distant phenomena. Those perceptually cohered connections are always materially real (they are produced materially within/across material bodies), yet, they do not have to reflect a physical cohesions.

For example, a perceived image with a background of the clouded sky, mountains in a great distance and a nearby tree creates a perspective-rooted cohesion — an image — based, among many other things, on the particular sensorial range (such as the ability to see in a particular distance). It does not alter the relationship between those ele-

[27] Bregman, *Auditory Scene Analysis: The Perceptual Organization of Sound*, 460.

ments (they persist when not observed) and it does not mean that the landscape would suffer some deep ontological re-arrangement if seen from a slightly different perspective.[28] In other words, the focal point of a (in this case — perceptual) position can create a tensor for a distributed cohesion that is oriented-to-from this particular perspective. A position becomes a turn-ing.

That positioning enables grasping of other material orders and does not entail simple indexicality, nor the construction of a 1:1 virtual parallel of the objective world by the perceiver's body. Rather, it results in an inevitably fragmentary figure-apparition, produced, for example, when a wavefront changes direction, and shaped more decisively by the embodied knowledge and sensuous imprint of experience. Here, both knowledge and experience are understood plurally, as broader circulations that exceed any single organism. Perception, in this sense, is never the operation of a solitary body.

Emergent parameters of auditory events, such as timbre, are particularly useful in this context, as they facilitate an immediate shift away from the external–objective | internal–subjective dichotomy toward a framework of spatiotemporally distributed events, without invoking metaphysical claims.

ii. Against resonance: the condition of incompossibility

In contrast to the process of broadly understood tuning, attunement does not signify adjustment to a given frequency or the establishment of a common vibrational order — a kind of resonant compromise.[29] If, as Heidegger states, "the moodedness of attunement constitutes existentially the openness to world of Dasein," attunement can instead be understood as the establishment of cohesion between materially incongruent regimens. Attraction or connection need neither presuppose the existence of a shared ontological system in which such cohesion is possible, nor entail the formation of a common code. In this sense, it is useful to reformulate Lyotard's notion of the *differend* as the ontological condition for all cross-phase material connections: no longer a

[28] The example given above resembles the famous question: "When a tree falls in a lonely forest, and no animal is nearby to hear it, does it make a sound?" The question, mistakenly attributed to the philosopher and mathematician George Berkeley and his *Treatise Concerning the Principles of Human Knowledge* from 1710, was asked by many philosophers and scientists.

[29] Donald E. Hall, *Musical Acoustics*, 3rd ed. (Belmont, CA: Wadsworth, 2002), 245–47.

case of a disagreement inexpressible within a shared, pre-existing system, but the more fundamental state in which such a system need not exist at all.[30]

Attunement must always negotiate the *differend* between divergent material regimens, while recognising that an encounter does not require the full translatability-transparency of the distributed entities involved. Applied to the often confusing realities of multimedia and multicode systems, the appearance of an image of a cat on a screen does not imply that the underlying electrical signal is materially connected to that cat, or to the broader category of mammals referred to as "cats" in English. Likewise, the recognition of that image as a cat — whether by a human, another animal, or a computer vision system — does not depend on compatibility with the logic of the file's particular extension.

That point could only be fully grasped and articulated through the experiments with the emergent timbres articulating with the simulated murmurations-topologies in the *Deviations of the Fruit Fly* (Figs. 2.4A and 2.4B). The subsequent environments of the video are set up as experiments in which agent-based particles interact without choreography, forming geometries determined by their dynamic rulesets and heuristics, along with attractors and deflectors embedded in the surfaces of the models. Data from all four dimensions of each sequence (three of space and one of time) is exported as a CSV file, preserving the full trajectories of each particle and recording changes in their direction and orientation. The sound is generated through direct mapping of this data: it traces both the individual particle paths and the changing contrast and motion of the geometric planes they form. The Blender environment is thus treated simultaneously as a dynamic three-dimensional spacetime and as its two-dimensional image. The resulting timbre emerges from the indexical modulation of a synthetic signal. Because this process requires minimal aesthetic decision-making, the sound functions as an auditory imprint of certain physical aspects of the images. Unlike a soundtrack composed by an entity operating within multiple aesthetic conventions—whether human or AI—the sound remains, to a significant degree, ontologically indifferent to the plane of cultural meaning, while sustaining strong cohesion within the shared data space.

[30] Jean-Francois Lyotard, *Differend: Phrases in Dispute: 46*, First edition (Minneapolis: University Of Minnesota Press, 1989).

Deviations of the Fruit Fly, 2023

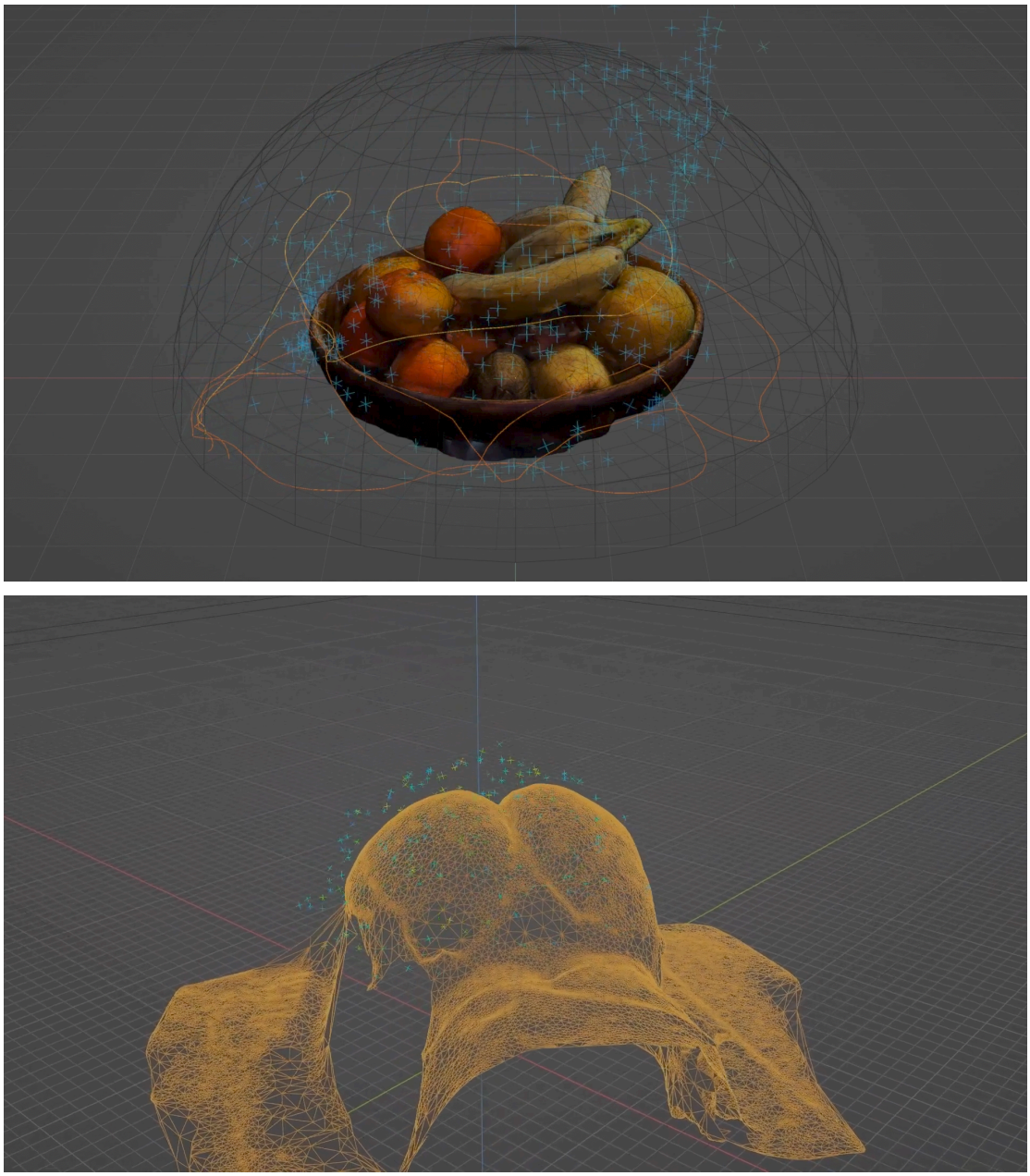

FIGURE 2.4A: Stills from the *Deviations of the Fruit Fly,* environments 1 and 3.

In collaboration with Jeremy Keenan (video, 3D swarm simulations, AI voice-over trained on author's voice samples, 2023), available at: youtube.com/watch?v=9PALZftcbxw.

The subsequent environments of the video are set up as experiments — the animated interactions of particles are not choreographed but conditioned by agent's behaviours and attractors embedded in the surfaces of the models.

Being part of the same system or sharing an atmosphere–mood does not mean that it matters or feels the same from different ontological positions. A forest at midnight in which the distant scream of an animal in pain resounds may, in systemic terms, have a single atmospheric composition, much as a chord or orchestral passage has a particular

Deviations of the Fruit Fly, 2023

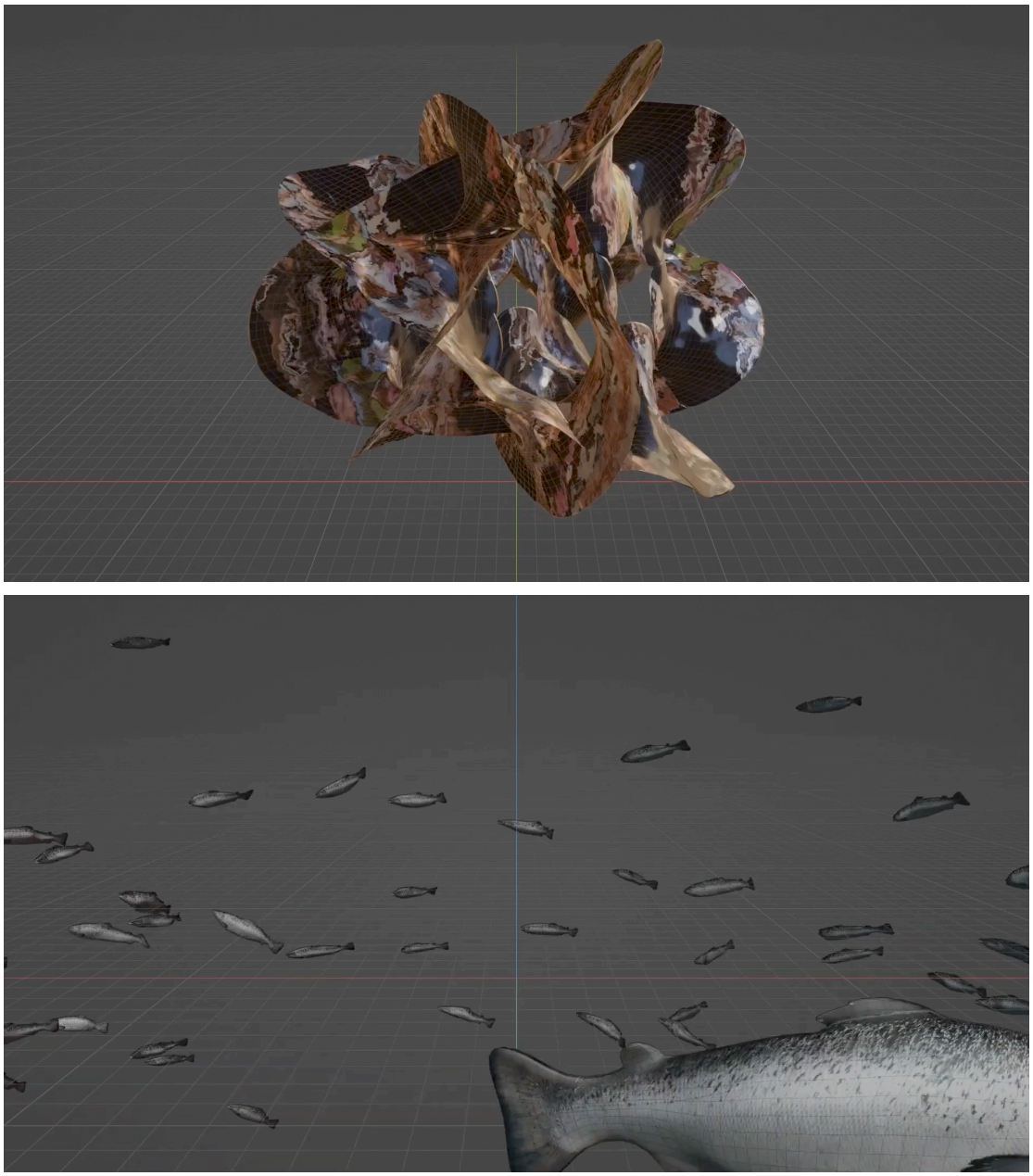

FIGURE 2.4B: Stills from the *Deviations of the Fruit Fly*, environments 5 and 7.

The sound is generated in an experimental technique that utilises the complex movement and positions of agents, also known as boids, in the 3D simulations. The X, Y, Z positions of the murmurating bodies become translated into a wavetable. The multiples of frequencies are based on the sonic fruit fly traps.

ensemble timbre. Yet the experiential "voicing" of that mood will differ. For many human and non-human animals, it may be fear-inducing; for those capable of self-reflection and embedding it in a language game, it might be classifiable as "scary." For

certain nocturnal predators, the same conditions would carry the excitement of a pending dinner. For organisms attuned primarily to electrical fields or humidity, the event would register as a neutral element of the night environment. These are not infinite, solipsistically fractured moods, but multiple concurrent articulations of a shared systemic state—comparable to distinct timbral lines within a composition, emerging from the same acoustic space yet oriented differently within it. In other words, the *is* of meaning differs depending on other belonging(s) of the systemic positions. The same matter in various systemic assemblages oscillates in different ways simultaneously — participates in diverse dynamic orders that can inhabit distinct logic of meaning production.

Therefore, it would be a mistake to equate mood with a form of resonance. Within the presented analytical framework, attunement cannot be reduced to resonance or resonant frequencies. Resonance, whether understood in its physical sense or as an image of thought for envisaging cohesions, is limited: beyond a certain point it becomes purely metaphorical, unable to account for cross-phase encounters of matter. Its constraint lies in the fact that cohesions are not confined to matching frequencies or affinities of vibration. Consequently, resonance offers little scope for conceiving cohesions that are neither grounded in nor oriented toward producing forms of commonality (homophily). To engage emergent cohesions that evade the logics of consonance and dissonance, attunement is better understood as timbral rather than resonant. Timbre foregrounds that the ontological *how* of motion is already emergent. Mood, like timbre, is the shifting orientedness of plural being.

2.3. Physics of trauma: in the wake of witnessing

Someone, I tell you, will remember us,
even in another time.

Six Fragments for Atthis, Sappho

i. The hold of weather and the second law of thermodynamics

In *In the Wake. On Blackness and Being* Christina Sharpe captures the circulation of antiblack exclusion in the fourfold move: Wake-Ship-Hold-Weather. Each of those intertwined images capturing the transatlantic slave trade describes an aspect of the material economy of racism, forming an argument without reducing it to a number of historical causes and socio-economical effects in the present. The material condition of antiblackness is captured in those four "ongoing locations" that together, through their tensions and articulations, reveal certain features of atmospheric violence. Concurrent material circulations that render black bodies simultaneously weak, beastly, inhuman, repulsive, fetishised or invisible are *not* separated in Sharpe's work into the layered or even dimensional version of reality that separates the political, the legislative, the cultural, the psychological, the algorithmic etc.

The atmosphere of antiblackness in Sharpe's argument is of spatiotemporal immediacy — it is always materially located in the current moment. The Weather allows for speaking about the patterns of circulation of the past in the present without stating fatalistically that the past always repeats itself. The Weather is "the totality of our environments; the weather is the total climate; and that climate is antiblack". Interestingly, the Weather is not merely an instantiation of the climate's pervasive operation — it *produces* the climate of antiblackness[31]. The dynamic of the weather-climate draws attention to the repeated emergence of the similar — the return of trauma of the Wake that keeps black bodies in the Hold. Sharpe investigates the paradoxical ability of the weather to "necessitate changeability and improvisation", describing it as the atmospheric condition of time and place, capable of producing new ecologies. Yet "while

[31] *"When the only certainty is the weather that produces a pervasive climate of antiblackness, what must we know in order to move through these environments in which the push is always toward Black death?"*
Christina Sharpe, *In the Wake: On Blackness And Being*, Illustrated edition (Durham: Duke University Press, 2016), 77.

the air of freedom might linger around the ship, it does not reach into the hold, or attend the bodies in the hold". Formation of atmospheric totality that repeatedly produces the same outcome — antiblackness — is systemic but not necessarily institutional or in any way external. Even if the legal and institutional structures do not seem to forcefully and logically imply exclusion, the atmosphere creates its conditions.[32] 'Atmosphere' opens up a possibility-opportunity but is not ontologically and teleologically defined by that portal.[33] In consequence, it is not the potential violence giving meaning to the hostile atmosphere — it is the hostile mood that already is a form of violence.

Here, the image of thought developed through the adapted graph theory is brought into dialogue with the image of the wake as articulated by Sharpe, to examine how both can be applied to understanding cohesion, belonging, and emergent patterning.

Living in the Wake means inhabiting the Weather of antiblackness — marked by shifting currents, turbulence, and difference — yet still bounded by the constraining edges of the wake. The V shape of the Wake necessitates a particular kind of motion *held* within its parameter.[34] Its contour does resemble the shape of the ship but is framed by the dynamic, expanding cut to the surface of the water. The edges of the wake are a part of the continuum of water, yet they produce a recognisable, lasting, complex intensity differentiated from its surrounding fabric. That image shows clearly that the logically primary principle of an event is motion, not identity, as differentiation can only be achieved through specifically oriented movement. Notably, the cut of the wake

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[32] *"It is weather, and even if the country, every country, any country, tries to forget and even if "every tree and grass blade of [the place] dies," it is the atmosphere: slave law transformed into lynch law, into Jim and Jane Crow, and other administrative logics that remember the brutal conditions of enslavement after the event of slavery has supposedly come to an end (Morrison 1987, 36)."*
Sharpe, *In the Wake: On Blackness And Being*, 76.

[33] *"(Opportunity: from the Latin Ob-, meaning "toward," and portu(m), meaning "port": What is opportunity in the wake, and how is opportunity always framed?)"*
Sharpe, *In the Wake: On Blackness And Being*, 11.

[34] *"A ship moving through water generates a particular pattern of waves; the bow wave is in front of the ship, and that wave then spreads out in the recognizable V pattern on either side of and then behind the ship. (…) The transverse waves are those waves that run through the back; they are perpendicular to the direction of the motion of the ship. Transverse waves look straight but are actually arcs of a circle. And every time, every instant that the boat is moving through water it has the potential to generate a new wave."*
Sharpe, *In the Wake: On Blackness And Being*, 40.

rarely happens on the perfectly still surface — water oscillates, circulates and changes its phase from liquid to solid and gaseous.

The difference between the wake and any other water disturbance or movement of water is that the wake creates a new system of motion that holds-folds the cohering elements together — it sets up the new belonging. The Hold-Mood of the Wake is then a long-lasting directionality and orientedness of matter defined or associated with a specific cohesion. The edge of the wake, in line with the adapted graph theory, is not a blurred boundary between the body of water and the disturbance, but an emergent line of intersection of all the associated waves. Consequently, the Grip-Hold-repetition of return should not be seen as some localised telos but rather a form of emergent dynamic patterning. When mood becomes ensnared in repetition, it transforms into atmosphere.

The relationship between causality and emergence, analysed in detail in Chapter 1, finds its reflection in the image of a wake. If causality and emergence are not treated as driven by the oppositional ontological logics, it becomes clear that they themselves become connected through the complex pattern of dependency. Complexity is not fractally infinite 'all the way down' and encompasses simple causal connections too. Getting rid of fundamentality understood in a reductionist way means that reality embraces many simultaneous ontological orders: in some cases, simple causal interactions lead to emergent behaviour and in some cases, they remain limited to their causal chain. The wake and its subsequent cohesions are undoubtedly a consequence of the ship, but that causal simplicity does not necessarily translate to temporal linearity. It means that events cannot be represented as arboreal charts reduced to past causes and future effects but should be considered in multiple dimensions, with carefully outlined scopes-cones of influence delineated by the possible speed of circulated information and different forms of material impact.

To grasp that subtlety, the Wake can be imagined here as a cone of light in Minkowski spacetime.[35] When envisioning the geometry of spacetime in special relativity, any event *A* opens up its own causal cone, whose boundaries are delineated by the speed of light. [36]

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[35] Francesco Catoni et al., *Geometry of Minkowski Space-Time*, 2011th edition (Springer, 2011).

[36] Hermann Minkowski, *Spacetime: Minkowski's Papers on Spacetime Physics*, ed. Vesselin Petkov (Minkowski Institute Press, 2020).

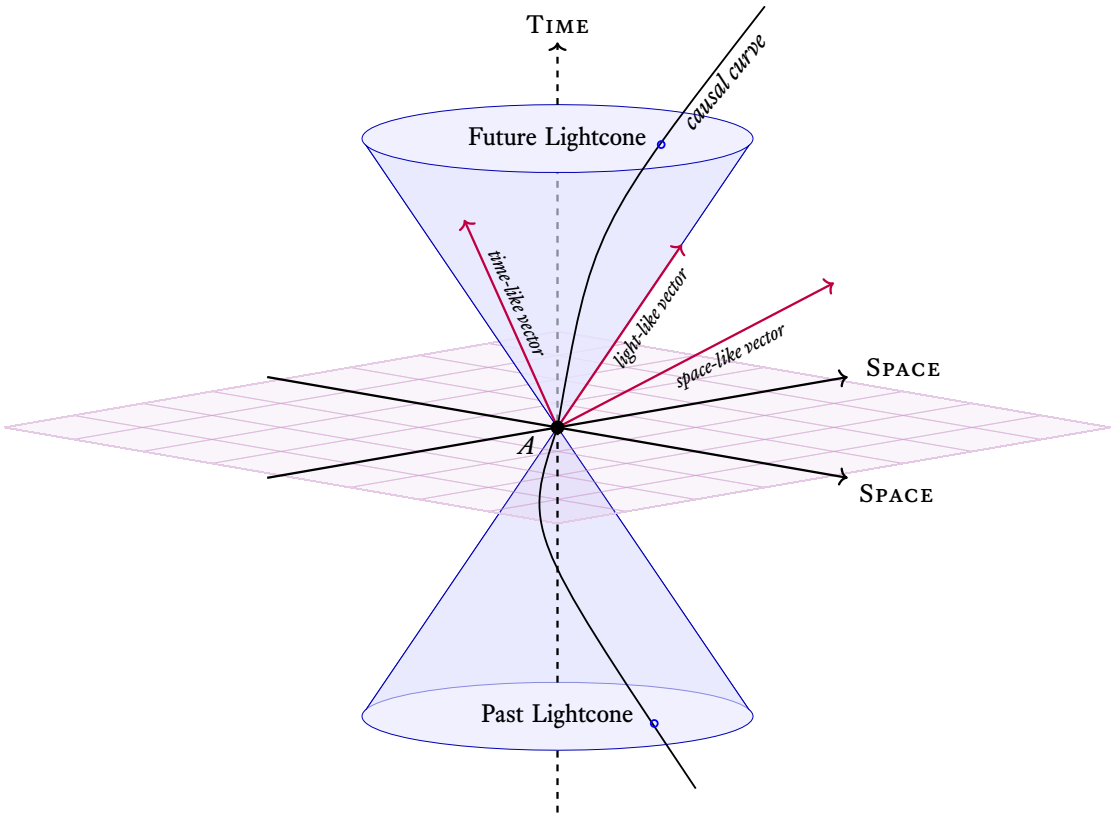

Figure 2.5: Minkowski spacetime diagram for event *A*.

Following the logic of that image, every event *taking place* in the Wake would belong to its cone time. In consequence, time and simultaneity of events are relative but causality stays invariant regardless of the position of the observer. That allows for the existence of multiple "truths" and durations (time dilation) within the event's cone of time that can vary but at the same time are not entirely arbitrary in their spatiotemporal or causal understanding.[37]

It would be tempting here to follow the visual similarity of the wake and the cone of time and claim that the wake offers the opportunity of collapsing of the past and the future because of certain logical (and visual) similarities between the past and the future cone. In this reading, the wake would operate simultaneously as a form of spatiotemporal entrapment and, in Sharpe's terms, as a portal — an "opportunity" to refold the past. However, considering that time is asymmetric and entropy prevents one from physically revisiting the past, seemingly, that could only be a metaphor for certain violent determinisms that historically violated groups experience *repeatedly*. That repetition of the past trauma is never exact because the fabric of reality changes, which

[37] Albert Einstein, *The Essential Einstein: His Greatest Works*, ed. Stephen Hawking (London: Penguin, 2008).

leads to undermining of the historical effect on the present. The way to understand that repetition could be through the preservation of the tensor field (mood as an emergent tensor field) in the cone of time. That enables the understanding of the preservation of the vectors of oppression (continuity in the direction, magnitude or orientation of oppression) in a physical sense, without violating the vector of time and the entropic principle. That image allows for grasping the power of precedence understood as an opening of a vector field—a manifold of spacetime.[38]

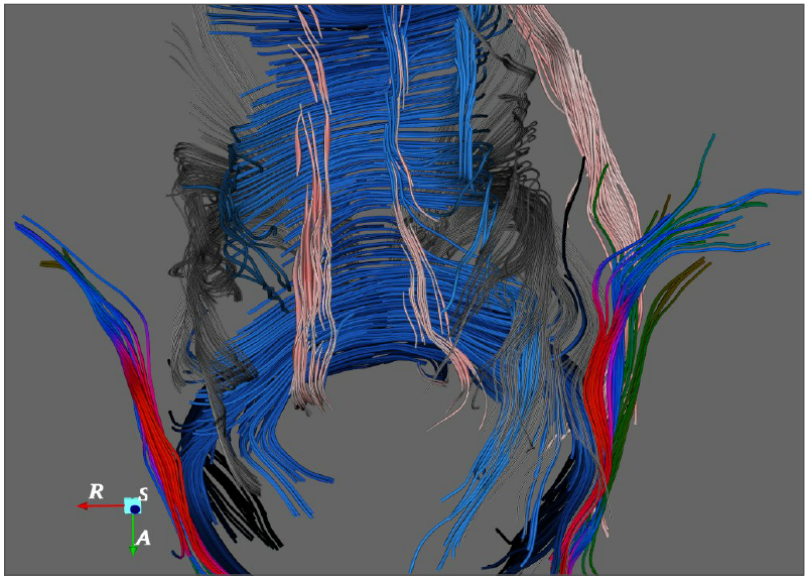

FIGURE 2.6: A tensor field visualization.

Haipeng Cai, *Zifazah: A Scientific Visualization Language for Tensor Field Visualizations*, Master Thesis, (University of Southern Mississippi: 2012), 22.

In the adapted graph-theoretical reading, the uniqueness of a wake has less to do with the outline of the ship than with the weight and speed that determine the force and direction impressed on the water. These factors distribute energy unevenly across wavelengths, so that shorter waves travel more slowly and hold a narrow line, while longer waves move faster and spread more widely. This matters here not for the sake of hydrodynamics, but because it shows how the persistence, overlap, and re-patterning of a wake are bound to the magnitude and direction of the forces that generate it. Like the cones of time, wakes meet and overlap, producing shifting topologies of superposition complicated by turbulence — a form of phase slip (Chapter 1). No wake's rhythm is ever entirely its own; each is modulated, reinforced, disrupted, or bent by others. The image becomes useful for thinking about how exclusionary logics — ra-

[38] The manifold is understood here mathematically, as a topological space.

cism, nationalism, classism, sexism, and various forms of sexual and identity normativity — do not simply coexist, but fold into one another through ongoing interference.

There is something about bodies of water that allows for a much quicker abandonment of the mechanical or strictly Newtonian perception of the world that theorises the space between things as empty or discontinuous. The existence of the wake long after the direct source of disturbance is gone cannot be questioned because it is visible as a pattern that combines diverse shapes and waves into a cohesive logic. In contrast, the lasting presence of historical events is sometimes undermined, as it escapes the commonsensical understanding of materiality as a sum of subjects and objects interacting under the physical laws in the immediate present. However, it is not particularly original to state that the materiality of the past makes up the fabric of the present. It is more challenging to map that complex dependency, to grasp how the past matters, what the mechanisms of that ongoing influence are, and in what ways historical traumas are experienced by the living — away from the new mysticism of ghosts, "vibes," the eerie, the unknowable, the inexpressible, or the liminality of the present as the intermediary state between the past and the future. What is kept, felt, and passed on is not some loosely defined metaphorical "energy" of the past and the ever-returning spectre of traumas. Trauma does not always need to be understood in a literal way, as a *physical* disturbance, but it must always be considered as a form of *material*, as opposed to metaphysical, circulation.

From a physics perspective, the movement of waves is not the transport of water along a sinusoidal path. Rather, it is the transmission of energy across the surface–thickness of the body of water. The passage of a ship initiates the emergence of a complex tensor of multiple directions, orientations, and fluctuations. This emergent tensor constitutes the Weather, or atmosphere, of the wake, expressing its distinctive pattern of motion, orientation, and the distribution of different forms of energy. A ship's wake also contains other types of disturbance — acoustic, thermal, or chemical — and, in a no less material way, it can leave a corporeal trace-wake in the form of collective memory, an image-imprint in durable materials, or hereditarily transmitted, recurring emotions. [39]Some of these traces initiate immediate causal chains that can be forensically reconstructed. Others simply persist — which is itself a form of motion along the time axis — to potentially cohere or emerge later in a specific mood-atmosphere, that is, when

[39] Jana Švorcová, "Transgenerational Epigenetic Inheritance of Traumatic Experience in Mammals." *Genes* 14, no. 1 (2023):

they become active within a particular configuration of distributed conditions and acting agents. Often, when the dispersal of energy is obscured or denied, such traces resurface suddenly and violently.

ii. Folding the wake: poiesis of witnessing

All suffering, injustice and death *matter* (produce matter), circulating in different material games or retained in the vector field of an event. However, the transformational analysis of energy can be at risk of falling into either the post-romantic personification of Matter-Nature who bears witness to those who died namelessly or stating that all matter *has* some transcendental memory of its previous iterations punctuated by intervals of death. Undoubtedly, the material trace is a form of physical retention that opens an opportunity for re-membering.[40] It would be a mistake, however, to perceive those variously preserved material impressions in a generationist way independently of sentience. Witnessing requires a different philosophical move.

Otherwise, it could be wrongly claimed that different forms of mood, atmosphere, or weather — preserved orientedness of matter — are themselves distributed testimonies, negating the possibility of complete annihilation. They are, to put it in Derridean terms, "readable or decodable archives" of matter. This is a particularly convenient position to exploit, especially in the absence of robust systemic structures of remembering or in situations involving strategic attempts to erase or rewrite history. For example, post-Holocaust Polish literature is permeated with images of nature in despair, irrevocably altered and redefined by the trauma of war; nature appears as a "silent witness" that will never forget the suffering and bloodshed.[41] This stands in sharp contrast to the politics of post-war remembrance, often marked by the obfuscation of Polish participation in the Holocaust and the avoidance of bringing those responsible to justice, including at the local level, where the neighbourly conspiracy of silence has, to

[40] Didi-Huberman, a philosopher and art historian, grapples with those material traces in "Bark" written after his visit to Auschwitz Birkenau where his grandparents had been killed. He reflects, for example, on "bizarre proliferation of white flowers on the exact spot of the cremation pits". Georges Didi-Huberman, *Bark*, trans. Samuel E. Martin (The MIT Press, 2017).

[41] Jacek Małczyński, 'Polityka Natury w Auschwitz-Birkenau' [Politics of Nature in Auschwitz-Birkenau], *Teksty Drugie* 2014 (1 January 2014): 141–58.

this day, prevented the determination of both the precise sequence of events and the number of victims.[42]

With the growing problem of circulated conspiracy theories (disinformation), accidental informational distortions created as a result of accelerated circulation and plurality of sources (misinformation), and AI deployed to fabricate data evidence of witnessing (algorithmic production of the counterfactual), it becomes crucial to distinguish between different forms of material memory.

The role of testimony is not to give proof of what happened. Witnessing and providing evidence belong to different material phase games. For Derrida witnessing is a distributed contract of faith where those for whom the act of witnessing happens (those remembered), the witness and the addressee [Derrida's division and phrasing] become connected through the oath of commitment.[43] The temporal act of having-been-present, evoking it in the present to oneself, for those who cannot speak, and subsequently to the potential "addressee," who may choose to believe or doubt the testimony, marks the nodes of this distribution. Echoing Paul Celan's poetry, Derrida writes that "there is no witness for the witness," signalling the solitude of the singular and irreplaceable encounter between the witness's unique framework and the event. This entanglement entails both a secret and a responsibility. There is no secrecy without responsibility, Derrida notes, because even the act of lying, perjury, or their mere possibility is inscribed in the language game of testimony.[44]

The position of the witness is thus an impossible one: it cannot be conveyed as proof, only as a poetic act through which the inexpressible is re-membered. That inexpressibility is not an ontological mysticism, but the impossibility so often articulated by sur-

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[42] Jan T. Gross, Neighbors: The Destruction of the Jewish Community in Jedwabne, Poland (Princeton, NJ: Princeton University Press, 2001).

[43] *"There is no testimony without some involvement of oath (Schwur) and without sworn faith. What distinguishes an act of testifying from the straightforward transmission of knowledge, from straightforward information, from the straightforward statement or the mere demonstration of a proven theoretical truth, is that in it someone commits himself in regard to someone, by an oath that is at least implicit. The witness promises to say or to manifest something to another, his addressee: a truth, a sense which has been or is in some way present to him as a unique and irreplaceable witness."*
Jacques Derrida, 'A Self-Unsealing Poetic Text. Poetics and Politics of Witnessing.', in *Revenge of the Aesthetic*, Michael P. Clark (University of California Press, 2023), https://doi.org/10.1525/9780520923508.

[44] Ibid.

vivors — and often misread as "survivor's guilt." There can be no witness to death, for those who have fully witnessed it can no longer bear witness.[45] If the truth of witnessing is not that of proof but of courage, it aligns with Foucault's account of Greek *parrhesia*: speaking the truth (to power) of what one knows to be true.

When considering witnessing, Derrida recalls Murray Krieger's words about art, whose role is "to play the unmasking role — the role of revealing the mask as mask (…) that is, in constituting itself poetry — implicitly constitutes its own poetic." This parallels Foucault's position on *parrhesia*: the speaker is both the subject of the enunciation and the subject of the enunciandum — the holder of the opinion to which they refer. More importantly, it reveals witnessing as an event of *poiesis*: not the recollection of a material trace, but the making of a trace-mark. Witnessing, unlike remembering, can alter the vector field of trauma, the orientation of its dynamic retention — it can change (though never reverse) the atmosphere.

What is missing in Derrida's account is the element of praxis that establishes a cohesion beyond discourse: a material framework-plane-wake connecting "addressees" to the past and transforming them into present witnesses. This spreading should not be understood as contagion, since it does not operate through the propagation of information between individuals or collectives. Rather, as poetic praxis, it is a wake created within a wake. In this sense, witnessing is a form of embodied knowledge — a multiphase system that can change how the past matters. The past is not closed, but it cannot be reversed or re-lived (or *relieved*).

Therefore, stating that stones, earth, sky or broadly understood matter are silent witnesses can only be a metaphor, even if their non-cognitive agency is taken into consideration.

Any kind of retention requires mattering-to, so the material trace of inanimate things is not devoid of reciprocity or meaning. To rephrase it in Spinozian sense, the material state of things changes when they get affected by other bodies (affection).[46] However,

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45 A distorted version of this argument presented by a Holocaust denier, Robert Faurisson, is referenced in *Differend: Phrases in Dispute* by Lyotard. Faurisson infamously claimed that he would only accept testimony of the gas chamber survivor in order to believe in Shoah. See: Jean-Francois Lyotard, *Differend: Phrases in Dispute: 46*, First edition (Minneapolis: University Of Minnesota Press, 1989).

46 Benedict Spinoza and Stuart Hampshire, *Ethics*, trans. Edwin Curley, Illustrated edition (London: Penguin Classics, 1996).

that affection in the case of non-sentient beings does not produce an affect — a corporeal state influencing potentia — the ability to act and transform based on the knowledge of the past. Witnessing as a poietic act is based on the ability to participate in the emergent distributed system of knowledge and the capability of changing the meaning of the corporeal trace of trauma. It can also set up new cohesions of *mattering-to—expanding-folding* the wake to indifferent parts of the system. As Derrida rightly notices, that plurality of witnessing evokes Heideggerian dasein. In that sense, it is similar to what Golding calls attunement or a task of art — a form of plural encounter or storytelling.[47]

[47] Johnny Golding, 'Fractal Philosophy: Attunement as the Task of Art', ed. Stephen Zepke and Simon O'Sullivan (Edinburgh, UK: Edinburgh University Press, 2010), 133–54, https://edinburghuniversitypress.com/book-deleuze-and-contemporary-art.html.

2.4. AI archives: aesthetics of re-assembly and the emergent bias of a synthetic canon

i. Automation of sense-making: matrices of meaning

The popularisation of AI marks a turning point in the automation, massification, circulation and understanding of knowledge systems. AI as a form of a synthetic, living archive and re-generative praxis bears profound consequences for witnessing, remembering and the wakes of past traumas.

The implications of generative AI for remembering practices, archival temporality, and commemorative infrastructures are substantial but extend beyond the scope of this section. Here, the focus remains on how the notion of mood, as assembled in this thesis, is preserved and re-emerges within AI architectures and outputs, and why this matters for addressing bias.[48]

The political analysis of generative AI tends to be limited to either investigation into various forms of training/pre-training on the problematised datasets "containing bias" or focused solely on the outputs serving as the culmination point of the meaning-making process.[49] The complex architectures of generative AIs often render them as operational singularities or black boxes, thereby preventing the scrutiny of their diverse

[48] For a related discussion on AI's role in memory and temporal inscription, see Sonia Bernac, Winnie Street, and Jackie Kay, *Chronoseed: The Generative Time Capsule*, *Antikythera: Journal for the Philosophy of Planetary Computation* (MIT Press, May 2025).

[49] While scholarship on the political implications of generative AI is expanding, it remains largely split between analyses of bias in training or pre-training datasets and examinations of outputs as the endpoint of meaning-making. A full synthesis of this literature falls outside the scope of this thesis, which focuses instead on the operational logics of generative architectures. See for example Abeba Birhane et al., "The Values Encoded in Machine Learning Research," *Proceedings of the 2022 AAAI/ACM Conference on AI, Ethics, and Society* (New York: Association for Computing Machinery, 2022), 389–399; Kate Crawford and Trevor Paglen, "Excavating AI: The Politics of Images in Machine Learning Training Sets," *Excavating AI* (2019), https://excavating.ai; Ruha Benjamin, *Race After Technology: Abolitionist Tools for the New Jim Code* (Cambridge: Polity Press, 2019); and Luke Munn, *Automation Is a Myth* (Stanford: Stanford University Press, 2022).

processes.[50] However, in order to fully grasp AI's synthetic moods, it is crucial to analyse the entire generative process.

The majority of the popular AI media generators utilise Diffusion Probabilistic Models, partially inspired by the nonequilibrium thermodynamics of gas molecules and their diffusion from high-density to low-density concentrations, in line with the law of entropy.[51] The logics of subsequent elements and processes of diffusion models are most easily traceable through image generators because of the possibility of immediate visualisation. During training, Gaussian noise is added to the mapping of the training images. Contrary to the diffusion models' predecessors, instead of modelling data dis-

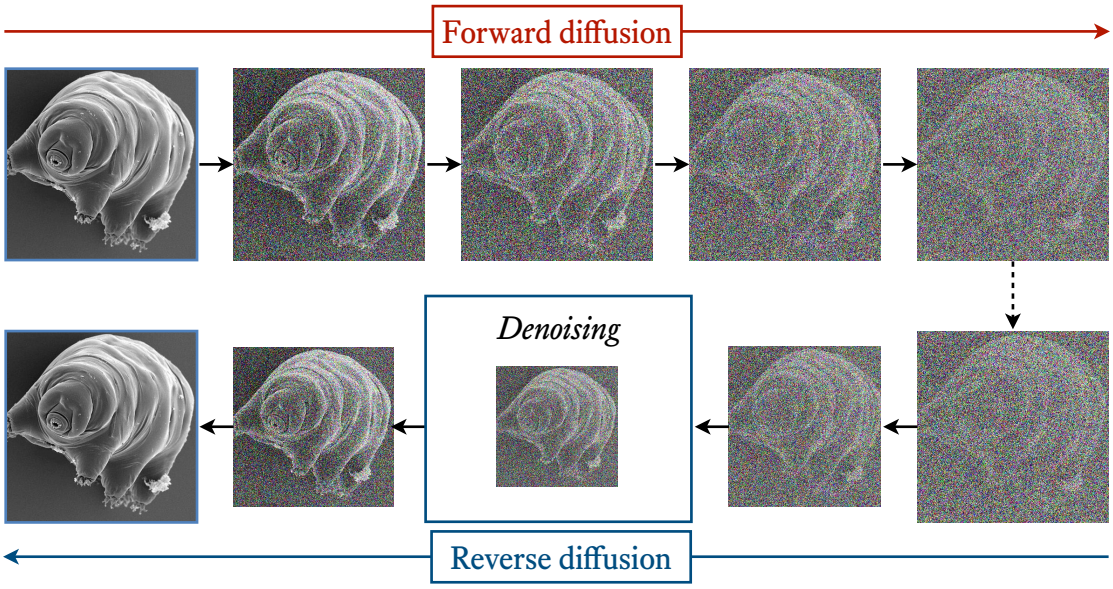

FIGURE 2.7: The diffusion model, with forward diffusion applying in sequence additive Gaussian noise, and reverse diffusion process in which a network is trained to reverse the corruption.

[50] Taina Bucher, *If...Then: Algorithmic Power and Politics* (New York: Oxford University Press, 2018).

[51] Lilian Weng, "What Are Diffusion Models?" *Personal Research Blog*. July 11, 2021.

tribution, the system learns the distribution of noise.[52] In the subsequent step, called reverse diffusion or denoising, the neural network "guesses" the noise sample and iteratively subtracts small amounts of it, starting from a point in the simple distribution, gradually transforming it into the desired complex data — a new image (Figure 2.7).

Seemingly, the process of generation starts with infinite possibilities of a noise sample guided only by a text and/or image prompt, and driven by multi-dimensional tensors. More specifically, in image generators such as Stable Diffusion, a random tensor gets generated and iteratively de-noised in the latent space. That tensor is controlled by the random number generator's seed — a number used to initiate the process. Due to the seed, the generative processes become deterministic, allowing for the replication of the same outcome.[53]

The AI generation process primarily unfolds within the latent space, a lower-dimensional manifold capturing meaningful features from complex, high-dimensional data. Each dimension in this space corresponds to a specific characteristic present in the training set, shaping the architecture of the latent space. Proximity in this space reflects similarity between data points, forming a matrix of proximal and distant embeddings.[54]

Referring to the processes of generation as "unfolding" is not purely rhetorical—the majority of publicly available generative AIs in their current forms are not only deterministic but also teleological. Despite the randomness of the initial tensor, the processes of the latent space unfold according to the meaning matrix constructed during pre-training. That pre-training takes the form of a neural network that serves as a se-

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[52] Diffusion models follow a different logic to their recent predecessors: GANs, or Generative Adversarial Networks. GANs are based on the scenario of a game, where two neural networks compete in a zero-sum contest. The generator produces samples of data based on the training set and its adversary — the discriminator — compares the created proposition with the distributions of the training data, marking them as either passing or fake. The aim of the game is to increase the generator's ability to produce more plausible samples. Yingying Peng. "A Comparative Analysis Between GAN and Diffusion Models in Image Generation." *Transactions on Computer Science and Intelligent Systems Research* 5 (August 2024).

[53] Yubin Ma, 'Guide to the Seed in Stable Diffusion', Aituts, 6 January 2023, https://aituts.com/stable-diffusion-seed/.

[54] Georgios Arvanitidis, Lars Kai Hansen, and Søren Hauberg. 2017. "Latent Space Oddity: On the Curvature of Deep Generative Models." *arXiv*. October 31, 2017. https://arxiv.org/abs/1710.11379.

mantic and aesthetic canon for the possible AI generations.[55] In contrast to previously used, manually labelled databases such as ImageNet, CLIP (Contrastive Language–Image Pre-training) used in the majority of popular AI generators, is a neural network trained on image-caption pairs harvested from the Internet by web crawlers, sometimes called spiderbots.[56]

Images and text extracted from captions or metadata are transformed into vector embeddings of the same size so they can be directly comparable — true pairs have a high similarity score (cosine similarity).[57] The use of vectors not only bridges the incommensurability of ontologically diverse media, such as text and image but also enables the production of a semantic mapping with proximal and distant concepts.

It is hardly a novel observation that, as an operational archive sourced from popular websites and platforms, CLIP captures, clusters, and recirculates entrenched social biases, forms of exclusion and violence, and even traces of criminal activity.[58] Precisely for this reason, critical examinations of AI databases have largely centred on the exclusionary logics of misrepresentation, underrepresentation, and the problematic provenance of the digital material from which they are built.

As much as those observations are valid, the architectural analysis of generative AIs reveals a much more nuanced problem of the automation of sense-making preceding the automation of generation. In that sense, AI generative image tools remain teleological processes, whose starting point is deterministically guided by the stochastically pre-clustered matrix of (in the best scenario) commonsensical readymades. As a sys-

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[55] Radford, Alec, Jong Wook Kim, Chris Hallacy, Aditya Ramesh, Gabriel Goh, Sandhini Agarwal, Girish Sastry, Amanda Askell, Pamela Mishkin, Jack Clark, Gretchen Krueger, and Ilya Sutskever. 2021. "Learning Transferable Visual Models from Natural Language Supervision." *Proceedings of the 38th International Conference on Machine Learning* (ICML 2021), edited by Hal Daumé III and Aarti Singh, PMLR 139: 8748–63.

[56] Junbum Cha, Jonghwan Mun, and Byungseok Roh, 'Learning To Generate Text-Grounded Mask for Open-World Semantic Segmentation From Only Image-Text Pairs', 2023, 11165–74, https://openaccess.thecvf.com/content/CVPR2023/html/Cha_Learning_To_Generate_Text-Grounded_Mask_-for_Open-World_Semantic_Segmentation_From_CVPR_2023_paper.html.

[57] Tao Yang et al., 'Visual Concepts Tokenization', *Advances in Neural Information Processing Systems* 35 (6 December 2022): 31571–82.

[58] David Thiel, "Identifying and Eliminating CSAM in Generative ML Training Data and Models," Stanford Digital Repository (2023), available at https://purl.stanford.edu/kh752sm9123, https://doi.org/10.25740/kh752sm9123.

tem of knowledge, CLIP becomes a stifling canon —it creates a readymade matrix of semantic proximities that prioritise literality, and common or historical use over updated or scientific classifications and quantitive rather than qualitative mapping. That identity matrix outlining the horizon for AI generations introduces a tensor field of established directions of clustering — a form of a distributed tensor-wake — that renders all outputs deeply pre-conditioned.[59]

This argument echoes Walter Benjamin's concern regarding the artwork's aura, famously threatened by mechanical reproducibility.[60] It now faces a new challenge from the logic of recombination driving processes of generative AIs and automated semantic maps outlining the horizon of their creative possibilities. To follow Benjamin's logic superficially, the possibility of infinite re-assembly through mechanical reproduction-repetition would lead to further distributed semantic satiation and loss of meaning. However, to slightly rephrase Benjaminian argument in terms of AI generators, it is not that each generated output weakens the aura of the data archive. Rather, the artwork's aura-mood of the generative process and its output (together considered an artwork), become an after-image of the meanings and patterns already established in the CLIP embeddings. In that sense, the AI generator, if not creatively challenged, becomes a teleological machine.

ii. Ensnared tensors

If mood refers to the dynamics of matter's orientation — a topology of space-time expressed here as a tensor field — then AI architectures could, at least in part, provide a way to trace the emergent patterns of that *mattering-to* within a partially isolated environment.

Tensors are the fundamental data structures representing and manipulating data in the subsequent stages of the generative process both in the latent space and in the original data space. They are multi-dimensional arrays of numbers that enable the detection, representation, learning, and generation of data patterns. They flow through the layers

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[59] Tensor field is used here in the philosophical understanding established before. It is crucial not to confuse this image of thought with Diffusion tensor imaging (DTI) which is a technique for MR images. Diffusion tensor imaging is not irrelevant in the context of this subject, however, its narrow medical application distracts from the argument of this thesis.

[60] Walter Benjamin, *The Work of Art in the Age of Mechanical Reproduction*, trans. J. A. Underwood, 01 edition (Penguin, 2008).

of a network during the forward propagation by passing information between the layers, multiplying the input by weights, adding biases, and applying activation functions. During the backpropagation phase, the gradients of a loss function are calculated and used to update the weights and biases of the network. Loss functions, also known as error functions, estimate how well an algorithm models the provided data.[61] [62]

However, despite the parallelism and multidimensionality made possible through the tensorial processes of generative AI, tensors in most generators end up producing recursive canons unfolding according to the matrix of the meaning embeddings, as discussed in the previous section.[63] They remain subject to the logic of teleological unfolding both in the goal-oriented operation, divided into precise stages and trapped in the abstract architectures.

In that sense, Lyotard remains right in his tirade about the perpetual return of semiotics in the "Tensor" in *The Libidinal Economy.* According to Lyotard, thinkers struggle to abandon the "nihilism of the sign" wrongly assuming that every "thing is posited as a message, that is, as a medium enriched with a sequence of coded elements" to be decoded-extracted.[64] Therefore, analytically, tensors in generative AI fail to fulfil the ambitions of the Tensor from the *Libidinal economy,* and end up operating in diametrically different ways despite sharing their name and the similarities of multidimensionality, non-linearity and ability to engage with complex structures.

Lyotard's tensor is a duplicitous sign, a form of a Hold that is not maintained through an outline of its boundary. The logic of its tensorial demarcation is different — the

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[61] Yannis Panagakis et al., 'Tensor Methods in Computer Vision and Deep Learning', *Proceedings of the IEEE* 109, no. 5 (May 2021): 863–90, https://doi.org/10.1109/JPROC.2021.3074329.

[62] In generative AI, the quality of representation is no longer comparatively assessed through the juxtaposition of the sign and the designate, but rather, becomes a quantifiable spectrum. The parameters of high-dimensionality versus low-dimensionality outline the horizon of the representational fidelity. Lower-dimensional spaces can represent simpler tasks, such as word embeddings in 50, 100, or 300 dimensions, in contrast, high-dimensional representations capture more intricate patterns and relationships in the data—image generators, such as Stable Diffusion operate in those high-dimensional spaces.

[63] Preslav Le, William Guss, Demi Guo, and Michael Carbin, "Tensor Comprehensions: Framework-Agnostic High-Performance Machine Learning Abstractions." In *Proceedings of the 25th ACM SIGKDD International Conference on Knowledge Discovery & Data Mining (KDD '19)*. doi:10.1145/3292500.3330648.

[64] Lyotard, *Libidinal Economy*.

tensor does not mark the already existing pattern but rather *is* a distributed pattern-mark itself. Its operation changes the economy of meanings — it is a form of embodied simultaneity that is neither a polysemic set of various meanings nor a relational network of endless semantic referrals (the structuralist meaning chase).[65] In Lyotardian terms, the tensor rotates and that spinning creates a graspable, instantaneously meaningful, embodied sign.[66]

The subtle working of a tensor can be demonstrated in Fred Moten's writing. The persistent return of *blue* establishes a poetic cohesion that is not an underlying structure but a mode — a sometimes conflicted, even frustrated, emergent orientation of textual matter. In his work, blue never collapses into mere metaphor; it recurs as feeling, colour, hue, as Blues, as the shadow of racism and exclusion, but also, simultaneously, as a site of hope and storytelling.

> "Blue is something (not) (in) between things—a medium, the material within which the pigment is suspended, through which it's transferred, in both reflection and absorption."[67]

To risk challenging generative AI with Lyotardian or poetic logic (poiesis), if tensors were not thought of as having an auxiliary, representative function but perceived as things themselves, then patterns would be seen as produced in encounters with the dataset rather than extracted from it. That could challenge the misconception of data starvation and, consequently, data inbreeding, identified as one of the future dangers for AI — the idea of scarcity of meaningful information that can be used for training of

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[65] *"High intensity: melting fragments that never were a totality into unheard of configurations: to logicians and other nihilists, the tensor is the name of impropriety."*
Lyotard, *Libidinal Economy*, xxi.

[66] *"If Flechsig, like our previous example Roberte, is a tensor sign, and not merely 'meaningful', it is not through the polysemia of statements which are attached to her name, it is through the vertigo of anal eroticism which grip s the libidinal Schreberian body of which the name of Flechsig is the extension. Vertigo because here once again, around the anus, the revolution of the disjunctive bar will become furious (…)."*
"It extends the spinning-top game beyond Schreber's organic body, into unexpected regions of the libidinal band: this name grasps them or rather brings them into existence at a stroke, like pieces of the vast anonymous erectile maniac labyrinth (...)."
Lyotard, *Libidinal Economy*, 59–60.

[67] Fred Moten, *Black and Blur* (Durham London: Duke University Press Booksirefox, 2017), 237.

AI models.[68] If patterns are not to be found in the scarce resource of data but produced, and datasets are not suspended in some sterile, abstract space, there must be a number of cohesive, meaning-producing logics that repeatedly refold the same datasets, producing structures in/of various moods. In this scenario, meaning is not a scarce resource to be diluted, hoarded or extracted.

The key difference is that the Lyotardian tensor would operate as an event of production rather than as a vehicle of transmission. In machine learning, a tensor is a multidimensional array for storing and manipulating numerical values — it does not generate patterns by itself but participates in the computations through which a model's architecture identifies and amplifies them. Even when such tensors are involved in complex, non-linear transformations, they remain part of an optimisation pipeline designed to converge toward predefined objectives. The Lyotardian tensor, by contrast, is not a container for something already given; it is the site at which meaning emerges. Its multidimensionality is not that of stored numbers but of simultaneous orientations that alter the very field in which they occur. Where the ML tensor circulates inherited structures, the Lyotardian tensor instigates the appearance of new ones — changing the topology of the space rather than moving values within a fixed one.

iii. The moodedness of style: emergent bias

Seemingly, the ability of generative AI to take on different "moods" is a technical innovation related to style transfer, and therefore best described in terms of particular architectural or algorithmic components.[69] However, the parameters described as a "style" in generative AI's user interface and the overarching aesthetics style of AI refer to diametrically different mimetic phenomena. Similarly to any other medium, automated generation is not itself texturally neutral or imperceptible. Despite the possibility to apply various generative styles, such as "analogue photography", "anime", "renaissance" or "hyperrealistic", the AI image outcomes often share a characteristic look quickly identifiable as the AI creation. Regardless of various applied styles and

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[68] Ilia Shumailov et al., 'The Curse of Recursion: Training on Generated Data Makes Models Forget' (arXiv, 14 April 2024), https://doi.org/10.48550/arXiv.2305.17493.

[69] Richard Shu, 'Transforming Images with ControlNet and Stable Diffusion: A Step Forward in Style Transfer', *Medium*(blog), 20 May 2023, https://rshu.medium.com/transforming-images-with-controlnet-and-stable-diffusion-a-step-forward-in-style-transfer-82eb7eb33a4f.

prompted scenarios, the outputs maintain a derivative, re-combinatorial look—a form of uncanny familiarity.[70] In that sense, the invisible medium of AI generators reveals its moodedness — a characteristic emergent mark-tensor. It seems that the emergent aesthetics of AI outputs is that of resemblance itself — it is the aesthetics of reassembly.

If aesthetics is emergent and preserves the algorithmic patterns of its processes, the engineering distinction between semantic and stylistic layers collapses in practice. As argued in this thesis, emergence here is not simply additive but reconfigurative, producing a terrain in which style and semantics converge as part of the same generative logic. Style is not only textures, colours, or media-specific light capture, but also high-level attributes such as semantic elements, object shapes, and the ideological logic behind particular aesthetic moves. Exclusionary logics can therefore persist through applied "styles" rather than from specific image–caption clusters in CLIP.[71] For instance, most online generators struggle to produce images of black or brown people using an "old painting" filter, retaining the features of the predominantly white subjects of old masters. Likewise, "cyberpunk" often yields female East Asian teenagers, while "fantasy" reproduces the sexist tropes of concept art.[72] This persistence arises because style in neural networks is processed across convolutional layers, relying on a functional separation of semantic and stylistic "layers" and on feature mapping as tensor arrays.[73]

Mapping, transferring and altering of style are based on the assumption of the logical possibility of disentanglement of the content and form.[74] Consequently, the difficulties associated with the so-called content "leaks" are approached as technical rather than philosophical challenges. Leakage as a broader phenomenon in machine learning refers

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[70] Sonia Bernac and Jeremy Keenan, "The Objections of Lady Lovelace: Diffusion Models and the Synthetic Muse." In *The Photographers' Gallery: Unthinking Photography*. 2024.

[71] Bianchi, Federico, et al. "Easily Accessible Text-to-Image Generation Amplifies Demographic Stereotypes at Large Scale." Preprint, November 7, 2022

[72] Kate Crawford and Trevor Paglen, Excavating AI: The Politics of Images in Machine Learning Training Sets (2019), https://excavating.ai.

[73] Leon A. Gates, Alexander S. Ecker, and Matthias Bethge. "Image Style Transfer Using Convolutional Neural Networks." *Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition* (2016): 2414–23. https://doi.org/10.1109/CVPR.2016.265.

[74] Zhizhong Wang, Lei Zhao, and Wei Xing, 'StyleDiffusion: Controllable Disentangled Style Transfer via Diffusion Models' (arXiv, 15 August 2023), https://doi.org/10.48550/arXiv.2308.07863.

FIGURE 2.8: Example of a failed attempt to address underrepresentation, where people of colour were depicted in SS uniforms — a historically implausible outcome given the racial exclusivity of the Nazi SS.
Reproduced after @JohnLu0x, *Twitter*, February 20, 2024 10:20 pm, https://archive.is/kzrXy.

to a case when unwanted information becomes a part of training data and the real quality of the model's prediction is compromised. The objective of style transfer training is for a model to focus solely on mapping the stylistic attributes, simultaneously faithfully preserving the input content. The leakage in that context would mean blurring the content and style elements.[75] The functional definition of content in the context of image generators is that which can be segmented — recognised and discerned as a separate entity.[76]

Encoding of style inevitably inherits politically embodied codes. For example, stylising a contemporary photograph as a Renaissance portrait might apply features of the 16th-century beauty canon — elongated forehead and nose, lightened eyebrows, reduced lip size, partial hair covering. While such changes do not alter the subject's overall racial expression, they reference historical beauty routines, such as forehead and eyebrow shaving for facial elongation.[77] Yet, for historical art styles where training set subjects were predominantly white, models are more likely to also lighten skin and hair, producing inadvertently whitewashed outcomes.[78]

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[75] Jarosław Kochanowicz et al., 'Diffusion Models in Practice. Part 2: How Good Is Your Model?', *Deepsense.Ai* (blog), 8 May 2023, https://deepsense.ai/diffusion-models-in-practice-part-2-how-good-is-your-model.

[76] Segmentation in the grammar of AI image generators means sectioning parts of the pixel space into distinguishable, recognisable elements that can be labelled.

[77] Jill Burke, *The Italian Renaissance Nude* (New Haven: Yale University Press, 2018), 42–47.

[78] Y. S. Park, "White Default: Examining Racialized Biases Behind AI-Generated Images," *Art Education* 77, no. 4 (2024): 36–45

On the preceding page: images generated by continuous training in POLYMORPH II.

However, the attempts to mitigate various forms of (mis and under)representation in generative AI often lead to paradoxical results. One of the most widely discussed mistakes of diversity overcorrection was a case of black, brown and East Asian people featured in the SS uniforms (Fig. 2.8), appearing in the World War II-themed images produced by AI generators.[79]

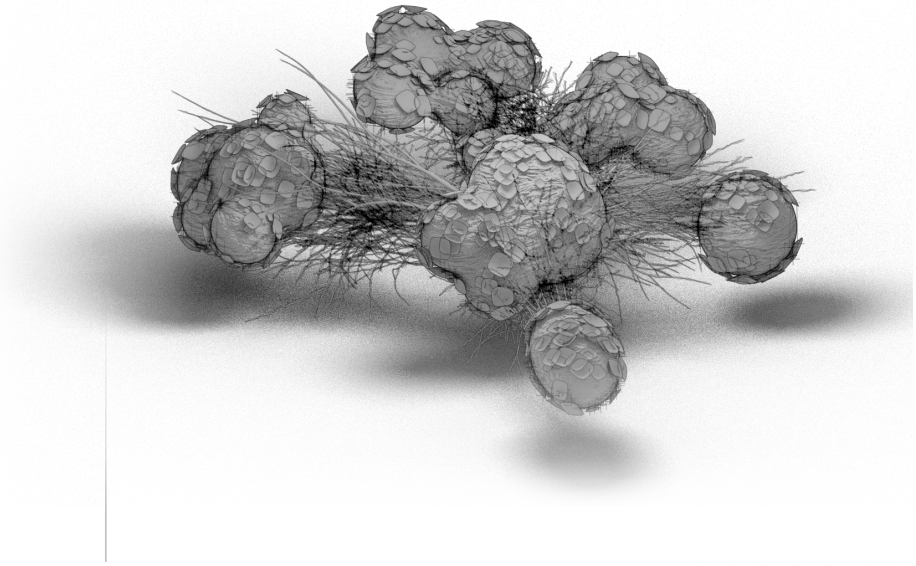
The Renaissance style example might suggest that bias can be corrected through deliberate style manipulation, selectively retaining certain formal features while enforcing diversity in others. Yet the Nazi uniform example case exposes a deeper limitation: surface attributes can be diversified without altering the latent structures linking style to historical and political meaning. The generator can depict a racially diverse Nazis not because it has transcended bias, but because its architecture never encoded the incompatibility between "SS uniform" and "diverse identity." What results is not a historically coherent counterfactual but a structurally permissible recombination of signs. Such bias cannot be easily "fixed", because the model operates without embedding the situated logics that would prohibit certain combinations. The Nazi uniform example is thus not an absurd glitch but a crystallisation of the model's structuralist and Neoplatonic assumptions, where form and content are endlessly recombinable, abstracted from the conditions that once made them matter.

Both the already discussed style of resemblance that dominates current AI media generators and the resurfacing of bias across applied styles cannot be solved by refining datasets or adjusting meaning embeddings. The underlying problem is that the logics of meaning-making — the contextual, historical, and political conditions under which certain combinations make sense or should be excluded — are not themselves tokenised or embedded. Without such structural encoding, the dominant mood-cohesion of these systems defaults to quantitatively weighted semantic precedence, anchoring the tensors of future AI generations to a narrow and historically skewed version of the past — a stereotype.

[79] Nico Grant, 'Google Chatbot's A.I. Images Put People of Color in Nazi-Era Uniforms', *The New York Times*, 22 February 2024, sec. Technology, https://www.nytimes.com/2024/02/22/technology/google-gemini-german-uniforms.html.

Chapter 3

The Book of Worms: recursivity, stochasticity and topological phase change



Introduction

Chapter 2 offered a rethinking of mood as an emergent mode within complex systems, enabling an understanding of change in its intricate dynamics without relying on any a priori collective consensus or external force. However, the framework presented has yet to address the anatomy and dynamics of a radical transformation, understood as a palpable shift in the system's overall state.

Building on the premise that AI intelligences, knowledge systems, and political dynamics form an interconnected ecosystem of cognitive infrastructures, Chapter 3 formulates a framework for analysing *radical* systemic changes—comparable to phase transitions—on a larger scale. It focuses on identifying and understanding paradigm shifts or political transformations, such as the rise of fascist tendencies, within ecosystems that are already in a constant state of reconfiguration, fluctuation, and evolution.

Drawing from the exploration of systemic features of fascistic circulation in Chapter 1 and the formulation of mood as an emergent mode of the system in Chapter 2, Chapter 3 shifts its focus to the generative logics of systemic processes and the potential for AI systems and infrastructures to produce the "new." The thesis seeks to develop an understanding of systemic novelty by examining various types of irregularities—such as noise, randomness, undecidability, error, accident, and fluctuation—and comparing their logics. While novelty is also a form of irregularity, it is distinguished from these others, leading to an investigation into what makes it unique in the context of systemic transformations.

The first section, *Computational Time: Path-deviations and Logics of Prediction*, situates AI within a broader historical context, examining how artificial systems have been falsely perceived as hyper-logical, opposed to the imperfect and organic nature of human intelligence. The central argument highlights the randomness, initially viewed as a source of noise and disorder, has been repurposed in synthetic systems as a tool for managing uncertainty and complexity.

Logics of Novelty: Stochasticity, Derivation, and Autocompletion clarifies the crucial distinction between derivative and stochastic logics, investigating the roles of randomness and uncertainty in synthetic systems. The discussion draws on Gerard Nestler's notion of the Derivative Condition and Venkatesh Rao's notion of Artificial Time to explore what kind of temporal shift is enabled by the proliferation of AI technologies.

The analysis highlights the implications of these logics for the emergence of novelty, questioning critiques that describe AI as merely recombinatorial or regurgitative.

The final section, *Logical Leap: Phase Change and Topological Transformation*, analyses phase transitions in complex adaptive systems, proposing that AI systems undergo topological changes that restructure their internal logics while maintaining systemic coherence. Through the experiments of Polymorph I and II, this section demonstrates how AI can escape the constraints of recursive path dependencies and enable systemic plasticity. Drawing on Giorgio Parisi's *multistability* and *systemic frustration*, the chapter suggests that AI's potential for topological transformation opposes the homogenising tendencies of fascistic logics, enabling richer dynamics in the human-AI cognitive ecosystem.

3.1. Computational time: path-deviations and logics of prediction

> The only way to rectify our reasonings is to make them as tangible as those of the Mathematicians, so that we can find our error at a glance, and when there are disputes among persons, we can simply say: Let us calculate, without further ado, to see who is right.
>
> Gottfried Wilhelm Leibniz[1]

i. Informational uncertainty: dialectics of pattern and randomness

This section argues that artificial systems, and by extension synthetic intelligences, are often caught in a false dialectics, where their computational functions are viewed as hyper-logical constructs, fundamentally at odds with the organic and imperfect human intelligence or the noisy nature of the material world. This section presents an original tracing of the historical emergence of this dialectical mapping. Understanding the genealogy of this divide requires an investigation into the early philosophy of coding, computing, artificial intelligence, and cybernetics.

Blaise Agüera y Arcas traces this misconception — that computation is inherently logical, rational, and optimal — back to the Leibnizian belief in universal truths revealed through binary calculations.[2] By the 1970s, the development of Good Old-Fashioned Artificial Intelligence (GOFAI), based on symbolic representations and human-designed rules, was already revealing its limitations and attracting criticism. For instance, philosopher Hubert Dreyfus, after being invited to review early work by scientists working on AI, argued that they set themselves up for failure, working from the rep-

[1] Gottfried Wilhelm Leibniz, *Philosophical Papers and Letters*. Edited by Leroy E. Loemker. 2nd ed. (Dordrecht: Springer, 1969), 51.

[2] Blaise Agüera y Arcas, "What Is Intelligence?" (Cognitive Infrastructures lecture series, CSM, London, July 4, 2024). Agüera y Arcas refers to Leibniz's remark, *"Omnibus ex nihilo ducendis sufficit unum"*, from *Explication de l'Arithmétique Binaire* (1703), meaning "In order to produce everything out of nothing, one [thing] is sufficient".

resentationalist, conceptualist, formalist, and logical-atomist assumptions.[3] In short, "turning rationalist philosophy into a research program".[4] He suggested that, instead, the brain might operate more like "a large array of *randomly* connected neurons," [my emphasis] challenging GOFAI's rigid, rule-based approach.[5]

The tension between designing computational systems as purely logical, rule-based constructs or integrating randomness became apparent in the early days of modern computing. The classical Turing machine, developed in the 1930s, exemplified a deterministic approach, performing operations with predictable outcomes.[6] However, the development of the Monte Carlo method by Ulam and von Neumann during the post-war atomic bomb research introduced randomness as a critical element in computational logic. Through random sampling, they could address complex, probabilistic problems in vast combinatorial spaces, which were otherwise impossible to simulate.[7]

The application of the Monte Carlo method required significant adaptations to the ENIAC computer, used in hydrogen bomb research.[8] This incorporation of randomness necessitated the separation of background coding (system management) from program coding (task-specific logic), allowing ENIAC to execute complex, probabilist-

[3] He referred to RAND Corporation scientists and the work of Alan Newell and Herbert Simon in Cognitive Simulation (CS).

> *"They had taken over Hobbes' claim that reasoning was calculating, Descartes' mental representations, Leibniz's idea of a "universal characteristic"—a set of primitives in which all knowledge could be expressed,—Kant's claim that concepts were rules, Frege's formalization of such rules, and Russell's postulation of logical atoms as the building blocks of reality. In short, without realizing it, AI researchers were hard at work turning rationalist philosophy into a research program."*

Hubert L. Dreyfus, *Why Heideggerian AI Failed and How Fixing It Would Require Making It More Heideggerian*, *Artificial Intelligence* 171, no. 7 (2007): 1137–1160, doi.org/10.1016/j.artint.2007.10.012.

[4] Dreyfus, "Why Heideggerian AI Failed," 1137–1160.

[5] Agüera y Arcas, "What Is Intelligence?"

[6] EITCA Academy, "How Do Deterministic and Non-Deterministic Turing Machines Differ in Terms of Computation Histories?," *EITCA Academy* (blog), August 2, 2023, https://archive.is/Boox5.

[7] James Bridle, *Ways of Being: Animals, Plants, Machines: The Search for a Planetary Intelligence*, 1st edition (London: Penguin, 2023).

[8] Klara Dán von Neumann was one of the first programmers playing a significant role in coding the first Monte Carlo simulations. Her contribution to the development of modern computation is often overlooked. Nic Lewis and Los Alamos National Laboratory, "The Woman behind the Curious Invention of Modern Software," *Los Alamos National Laboratory*, 2023, discover.lanl.gov/news/0323-von-neumanns-letters/.

ic simulations more efficiently.[9] However, integrating randomness into computational systems was not without its challenges. Generating "truly" random numbers required non-deterministic sources capable of producing large quantities of such numbers in the automated way.

In response to this demand, the RAND Corporation published *A Million Random Digits with 100,000 Normal Deviates*, a book that provided a collection of random numbers generated via a roulette wheel linked to a computer.[10] As demand for random numbers grew, the development of various Hardware Random Number Generators (HRNGs) followed.[11] These HRNGs, utilising physical phenomena, such as thermal noise, quantum tunnelling, chaotic systems, and free-running oscillators, provided unpredictable, and non-repeating values.[12] Specifically, that "utilisation of physical phenomena" means sampling the values of irregularities found in real-life "noise" such as electronic jitter or Brownian motion.[13] Today, HRNGs remain relevant in contemporary computing, particularly in fields like cryptography, where true randomness is essential for security.[14]

However, in areas like machine learning, the reliance is typically on pseudorandom number generators (PRNGs) — algorithms that generate sequences of values which,

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[9] Bridle, *Ways of Being*.

[10] RAND Corporation, *A Million Random Digits with 100,000 Normal Deviates*, originally published in 1955 by The Free Press, RAND edition (Santa Monica, CA: RAND, 2001), http://www.rand.org/.

[11] In this argument, the creation of specific automated HRNGs is being described. Hardware Random Number Generators in their predigital forms had existed for a long time before the rise of Monte Carlo methods as well as mechanical and electronic computers as described in: Pierre L'Ecuyer, "History of Uniform Random Number Generation," in *2017 Winter Simulation Conference (WSC)* (2017 Winter Simulation Conference (WSC), Las Vegas, NV: IEEE, 2017), 202–30, https://doi.org/10.1109/WSC.2017.8247790.

[12] "A Comprehensive Review of Quantum Random Number Generators: Concepts, Classification and the Origin of Randomness," *ar5iv*, accessed September 7, 2024, https://ar5iv.labs.arxiv.org/html/2203.00261.

[13] Berk Sunar, "True Random Number Generators for Cryptography," in *Cryptographic Engineering*, ed. Çetin Kaya Koç (Boston, MA: Springer US, 2009), 55–73, https://doi.org/10.1007/978-0-387-71817-0_4.

[14] Mark Tehranipoor, N. Nalla Anandakumar, and Farimah Farahmandi, "True Random Number Generator (TRNG)," in *Hardware Security Training, Hands-On!*, ed. Mark Tehranipoor, N. Nalla Anandakumar, and Farimah Farahmandi (Cham: Springer International Publishing, 2023), 19–33, https://doi.org/10.1007/978-3-031-31034-8_2.

while appearing random, are predetermined by a starting point using a mathematical formula.[15] That starting point is called a (random) "seed" and could be a number or a vector initiating the calculations. The seed becomes a unique key that, if shared, can reproduce the same sequence of numbers, ensuring the repeatability of a process. This becomes particularly relevant with the rise of generative AI, where the seed value establishes the model's initial state. By reusing the same seed, the model can consistently reproduce the exact output, allowing for control over generated content.[16]

The consequences of this shift were the incorporation and experimentation with randomness as a part of computational logic, both in the development of new software programs and in the creation of hardware designed to handle extensive random sampling methods and probability-based computations.[17] While probabilistic reasoning had long been established in mathematics and science, it was not until the development of the Monte Carlo method that randomness became a fundamental tool in computational logic, enabling computers to navigate uncertainty and complexity.

A dialectics similar to that between determinism and randomness can be found in Claude Shannon's communication theory: the tension between signal and noise. Although the origins of binary code can be traced back to Leibniz, it was Claude Shannon who played a crucial role in applying binary code to the digitisation of information, media, and communication by encoding them as sequences of zeros and ones. Prior to Shannon's reformulation, analogue systems of telegraphs were based on amplifiers placed at regular intervals along the length of the cable. The problem, however, was that amplifiers could not distinguish between signal and noise, amplifying both indiscriminately and posing a serious obstacle to long-distance communication.[18] The term 'bit' (binary information digit) first appeared in the context of information transmission in Shannon's paper. He proposed that instead of interpreting a continuous spectrum of signals, it would be more efficient to distinguish between two states, thus

[15] Takreem Haider, Saúl A. Blanco, and Umar Hayat, "A Novel Pseudo-Random Number Generator Based on Multi-Objective Optimization for Image-Cryptographic Applications" (arXiv, July 8, 2023), http://arxiv.org/abs/2307.03911.

[16] Alexander Quinn Nichol and Prafulla Dhariwal. "Improved Denoising Diffusion Probabilistic Models." *arXiv* preprint, June 11, 2021. https://arxiv.org/abs/2102.09672.

[17] Martin Weigel, "Monte Carlo Methods for Massively Parallel Computers" (arXiv, September 13, 2017), https://doi.org/10.48550/arXiv.1709.04394.

[18] John R. Pierce, An Introduction to Information Theory: Symbols, Signals and Noise, 2nd ed. (New York: Dover Publications, 1980).

transmitting information as a binary package. Bit, in that sense, is a logical unit, the smallest amount of information necessary to determine which of the two (equally) possible states the system has taken.[19]

To formulate his theory of information, Shannon borrowed Boltzmann's take on entropy, originally used to describe disorder in thermodynamic systems, and applied it as a measure of uncertainty in information. By doing so, Shannon transformed entropy into a statistical tool for quantifying how much unpredictability, and therefore information, is reduced when a message is received.[20]

That reformulation of transmission of information formed the foundation of digital computing and modern communication systems, leading to the development of efficient digital communication networks. Shannon's definition specifically did not aim to talk about the meaning or context of transmission.[21] His formulas were based on probability theory and statistics, as Katherine Hayles observes: "as a probability function with no dimensions, no materiality, and no necessary connection with meaning".[22]

To verify that claim it is essential to look at two key equations from Shannon's information theory compared below—information entropy and self-information—that form the foundation for understanding information in communication systems. Entropy and self-information quantify the uncertainty and information's "surprise", respectively.

Entropy	Self-information
$H(\mathrm{X}) = -\sum_{i=0}^{n} p(x_i)\log_2\left(\mathrm{p}(x_i)\right)$	$I(x) = -\log_2\left(p(x)\right)$

[19] Claude E. Shannon, "A Mathematical Theory of Communication." *Bell System Technical Journal* 27, no. 3 (July 1948): 379–423.

[20] James Gleick, The Information: A History, a Theory, a Flood (New York: Pantheon, 2011), 226–230.

[21] *"Frequently the messages have meaning; that is they refer to or are correlated according to some system with certain physical or conceptual entities. These semantic aspects of communication are irrelevant to the engineering problem."*
Claude E. Shannon, *A Mathematical Theory of Communication*, (Reprinted with corrections from *The Bell System Technical Journal*, vol. 27, 1948), 623–656.

[22] N. Katherine Hayles, *How We Became Posthuman: Virtual Bodies in Cybernetics, Literature, and Informatics*, 1 edition (Chicago, Ill: University of Chicago Press, 1999).

$H(\mathrm{X})$	The amount of uncertainty (or average information) in the set of outcomes $X = \{x_0, \ldots, x_n\}$.
$p(x_i)$	The probability of a specific outcome x_i happening.
$\log_2$	The base 2 logarithm, which shows how many "bits" of information are needed to describe the outcome.

Entropy quantifies the average uncertainty across all possible events in a system. If one event is certain (probability 1), then entropy is zero, meaning no uncertainty across the system.

$I(x)$	The self-information, or the amount of information contained in the outcome x.
$p(x)$	The probability of outcome x.
$\log_2$	The base 2 logarithm, indicating that the information is measured in bits.
$-$	Minus sign ensures that the value will always be positive or zero (note that $0 \leq p(x) \leq 1$).

Self-information quantifies the surprise of a single event. If the probability is 1, then the self-information is zero, meaning no surprise.

Shannon's notion of *self-information* defines the informational content of an event in relation to its probability: the less likely an event, the more information it conveys when it occurs. This reframes information not as semantic content but as a function of statistical rarity. Entropy, in turn, measures the average self-information across all possible outcomes, offering a way to quantify the overall uncertainty of a system prior to the receipt of a message. While this definition diverges from everyday or thermodynamic uses of the term, it is precisely this abstraction that allows Shannon to model communication independently of meaning. Within this statistical framework, the distinction between signal and noise emerges not through semantic differentiation but through differences in predictability.

The majority of scientists at the Macy conferences (1946–1953) viewed Shannon's theory as quantifiable and therefore objective, deliberately excluding unquantifiable

variables from scientific discourse.[23] Despite Shannon's original focus, his definition of information has been applied broadly across both the sciences and humanities, shaping the commonsensical understanding of information.[24] This has led to associating information with objective, universally true facts, independent of context, while reinforcing the dialectic between information and noise. The quality of information became linked to the concept of "surprise."

Undoubtedly, Shannon's work had a significant and positive influence on the development of AI, particularly in terms of tangible technological inventions. His early speculations about programmable computers, combined with his work on chess algorithms, played a key role in shaping later developments in machine learning techniques.[25]

However, the philosophical implications of Shannon's information, and specifically, implication for the understanding of digital matter and material are more ambiguous. Katherine Hayles claims that Shannon's formalisation fostered the belief that patterns or meaningful information stand in ontological opposition to noise.[26]

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[23] *"Shannon's approach had other advantages that turned out to incur large (and mounting) costs when his premise interacted with certain predispositions already at work within the culture. Abstracting information from a material base meant that information could become free-floating, unaffected by changes in context. The technical leverage this move gained was considerable, for by formalizing information into a mathematical function, Shannon was able to develop theorems, powerful in their generality, that hold true regardless of the medium in which the information is instantiated."*
Hayles, *How We Became Posthuman*.

[24] Shannon's definition was not the only available theory at that time. Undoubtedly, it had an advantage of easy quantification and generalisation, but there were many theories, for example that of Donald MacKay that took the context and meaning of information into consideration. He proposed that Shannon's information should be defined as "selective", and the equations and theories dealing with the receiver's mindset, the context and how the message should be understood could complement it, providing 'structural' information.
Hayles, *How We Became Posthuman*.

[25] Claude E. Shannon, "XXII. Programming a Computer for Playing Chess," *The London, Edinburgh, and Dublin Philosophical Magazine and Journal of Science* 41, no. 314 (March 1950): 256–75, https://doi.org/10.1080/14786445008521796.

[26] *"Noise interferes with the message's exact replication, which is presumed to be the desired result. The structure of the theory implied that change was deviation and that deviation should be corrected."*
Hayles, *How We Became Posthuman*, 63.

Cecile Malaspina identifies greater subtlety in the implications of Shannon's (and Norbert Wiener's) theories, pointing to an inherent paradox that arises when the formulas are viewed through the lens of the opposition between information and noise. While it may seem intuitive to equate information with unpredictability—recognising that a predictable message offers no new information—Shannon's theory leads to the counterintuitive conclusion that more information brings greater uncertainty.[27] This paradox challenges the commonsensical understanding that information's role is to reduce uncertainty, not increase it. Malaspina notices, however, that the paradox can be resolved through the temporal, process-oriented analysis of the moment of information production and realising the importance of Shannon's emphasis on choice. Shannon pointed out that information comes from making a choice between different possibilities. The greater the number of possible choices and the less predictable the outcome, the more information is generated. He highlighted that this "freedom of choice", or uncertainty, is crucial for measuring information. Building on that, Malespina proposes that information is not a static entity but a function of the relationship between what has already been selected and the set of possible messages under the current constraints — "[information] characterizes a progressive modulation of certainty and uncertainty".[28] The more choices are made, the more uncertainty is introduced, as each step modifies the context in which subsequent choices are made in an epistemological conversion from the unknown to known. She claims that Shannon's

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[27] Cecile Malaspina, *An Epistemology of Noise* (London: Bloomsbury Publishing, 2018).

[28] "*The previous state is thus factored into the probability with which the next symbol is chosen as the most likely, in what is called the Markoff process. It is this progressive relation of probability, which turns out, as Weaver says, 'to be exactly that which is known in thermodynamics as entropy' (Shannon and Weaver 1964). 'Information Entropy' is thus a measure of the probabilities involved in progressing through stages of selection, indicating the probabilities with which, at each stage, certain symbols will be chosen next. It is thus never, the individual message that is carrier of information, but its relation with the set of all possible messages under equivalent constraints, a relation that changes as the transmission progresses: (…)*"

Cecile Malaspina, *An Epistemology of Noise* (London: Bloomsbury Publishing, 2018), 39.

theory reframes information as a probabilistic structure, where uncertainty is not simply reduced but modulated through a sequence of interdependent selections.[29]

ii. Deep computation: emergent assembly time and recursivity

There are more immediate and technologically relevant historical moments of innovation that directly shaped current AIs. This section is preoccupied, however, with exploration of the history of the *logics* of synthetic meaning making and how the "new" information emerges/is produced out of "old"data. That requires a mapping of the emergence of contemporary understanding of information and pattern, its attempted quantisations, as well as its temporal positioning — a relationship to the past and the future.

The attempt at quantisation, formalisation, and, most importantly, protocolisation of knowing and learning was concurrent with the development of early computers and intelligent systems. Cybernetics, emerging during this period, introduced feedback as a key mechanism for regulating systems, whether biological or mechanical.[30] In 1943, McCulloch and Pitts laid the theoretical groundwork for neural networks, drawing on a simplified understanding of neurons as binary decision-makers.[31] Building on this, Frank Rosenblatt introduced the Perceptron in 1958, which adjusted weights through feedback, creating a basic learning mechanism in machines. However, experimentation with the Perceptron ended in the late 1960s after criticism for its inability to solve complex problems, like those requiring nuanced, non-linear relationships between

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[29] *"To equate information with unpredictability is intuitive enough, if it is to tell us something new, something that does not follow automatically from what came before. It is equally easy to accept that a message we can fully predict is redundant, if it gives us no new information. What is much less intuitive are the consequences Shannon and Weaver draw from this unpredictability. By aligning the concept of information with uncertainty and by quantifying it as such and without concessions, we arrive at the apparently paradoxical conclusion that more information means more uncertainty. This appears paradoxical, in the sense that it contradicts the equally common assumption, even the doxa (opinion or dogma), that information is what reduces uncertainty, rather than increasing it."*
Malaspina, *An Epistemology of Noise*, 23.

[30] Bruce Clarke and Mark B. N. Hansen, eds., Emergence and Embodiment: New Essays on Second-Order Systems Theory(Durham, NC: Duke University Press, 2009).

[31] McCulloch, Warren, and Walter Pitts. "A Logical Calculus of the Ideas Immanent in Nervous Activity." *Bulletin of Mathematical Biophysics* 5, no. 4 (1943): 115–133.

variables. For example, it struggled with tasks where a simple yes/no answer depended on multiple overlapping factors, such as distinguishing between two conditions that could not be separated by a clear rule.[32]

Despite these initial setbacks, research on feedback-based learning in early models played a significant role in shaping what is now known as connectionist AI, often seen in contrast to symbolic AI.[33] A crucial advancement in the feedback-based learning systems was the introduction of multi-layer networks, which allowed them to overcome the non-linear patterns problem.[34] This shift from single-layer to multi-layer networks eventually led to the development of deep learning used in most popular contemporary AIs such as large language models (LLMs).

In connectionist AI, feedback is a core mechanism for learning. These networks process inputs, apply weight adjustments based on feedback, and pass modified outputs to subsequent layers, enabling the system to identify patterns and adjust predictions without predefined rules. After making a prediction, the model measures the error by comparing the predicted result to the actual one, and this information is fed back through the network. During backpropagation, the model adjusts the weights of its internal connections to improve accuracy. Over multiple cycles, this process refines the system's ability to capture complex relationships, with feedback acting as a continual process of adjustment that enhances the model functioning over time.[35]

While the technological difficulty of the working of deep learning, and other AI technologies is to some extent exaggerated and mystified, it could be argued that its operational logic is fairly simple. At its core, deep learning operates by continuously adjusting the internal weights of a multi-layer network through feedback loops, refining its predictions and learning to capture complex patterns without explicit programming. In temporal terms, the system integrates past errors into its structure, continually refining and reshaping future predictions.

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[32] Marvin Misky, and Seymour Papert. Perceptrons: An Introduction to Computational Geometry. Cambridge, MA: MIT Press, 1969.

[33] Terrence J. Sejnowski, *The Deep Learning Revolution*. Cambridge, MA: MIT Press, 2018.

[34] Ian Goodfellow, Yoshua Bengio, and Aaron Courville. *Deep Learning*. Cambridge, MA: MIT Press, 2016.

[35] Sejnowski, "The Learning Algorithm", *The Deep Learning Revolution*. Cambridge, MA: MIT Press, 2018.

The following equation is the core part of the gradient descent algorithm used for optimisation in machine learning, particularly in backpropagation for training neural networks.[36]

$$\omega_{\text{new}} = \omega_{\text{old}} - \eta \frac{\delta E}{\delta \omega},$$

where:

ω_{new} The update weight after learning, or the refined parameter of the model.

ω_{old} The current weight before the update, representing the system's existing knowledge.

η The learning rate, a small positive constant that determines the size of the adjustment or step made in each iteration. It controls how quickly or slowly the model learns. The minus sign is crucial: it ensures the update moves *downhill* on the error surface, reducing error rather than increasing it.

$\delta E / \delta \omega$ The gradient of the error function E with respect to the weight ω. This measures how much the error changes with small changes in the weight, guiding the direction and magnitude of the adjustment.

To reiterate, the argument of this section is not to equate deep learning with gradient descent or undermine the technological complexity of AI learning. Rather, it is to investigate the overarching temporal logic of knowledge production and its relationship with memory. The temporal logic of deep learning with an emphasis on prediction could be presented as following:

$$W_{\text{future}} = W_{\text{present}} - \eta \frac{\partial \text{error}}{\partial W_{\text{present}}}$$

Agüera y Arcas emphasises the fundamental role of prediction in both synthetic and non-synthetic systems. He suggests that intelligence is fundamentally a probability function; specifically, a function that predicts the future based on the past:

$$p(\text{future} \mid \text{past}) = \text{conditional probability of } \textit{future} \text{ given } \textit{past}.$$

[36] Ahmed Gad, "A Comprehensive Guide to the Backpropagation Algorithm in Neural Networks," neptune.ai, July 21, 2022, https://neptune.ai/blog/back-propagation-algorithm-in-neural-networks-guide.

He argues that intelligence, much like life, is rooted in computation and operates as a predictive mechanism that refines itself through feedback. This predictive function is what enables both biological and artificial systems to adapt, learn, and sustain themselves over time — to "predict themselves into existence".[37] His position is based on the experiments with the coding structures of the minimalist programming language, comprising only eight commands, called "Brainfuck". Despite its minimal functionality, Brainfuck is Turing-complete, meaning it can theoretically perform any computation that a more complex language could. In the experiment, random strings of code are combined and executed, initially producing no meaningful output. Over millions of iterations, some code sequences evolve the ability to self-replicate, leading to the spontaneous emergence of structured, computational replicators. Randomness in the brainfuck experiment acts as a crucial source of variation, introducing unpredictable changes into the code sequences. These random mutations provide the necessary diversity for the evolutionary process and eventual emergence of self-replicating structures out of the "primordial soup".[38] According to Agüera y Arcas, intelligence is an inevitability of any complex system capable of computation and adaptation, driven by the process of prediction and feedback over time. In his perspective on the history of synthetic intelligence, the "fairydust" — the ingredient enabling creation of [general] artificial intelligence and life turned out to be linked to the size of the model (combination space).[39]

```
++++++++[>++++[>++>+++>+++>+<<<<-]>+>+>->>+[<]
<-]>>.>---.+++++++..+++.>>.<-.<.+++.------.--------.>>+.>++.
```

FIGURE 3.1: Example of Brainfuck code. The code prints out "Hello World!" to the console.

similar approach to time and information, which does not depend solely on initial conditions but instead emerges through layers of evolutionary feedback and randomness,

[37] Blaise Agüera y Arcas, What Is Life?: Evolution as Computation (Cambridge, MA: MIT Press, 2025).

[38] Blaise Agüera y Arcas, Jyrki Alakuijala, James Evans, Ben Laurie, Alexander Mordvintsev, Eyvind Niklasson, Ettore Randazzo, and Luca Versari. *Computational Life: How Well-formed, Self-replicating Programs Emerge from Simple Interaction*. arXiv:2406.19108 (June 2024).

[39] Ibid.

is articulated in Assembly Theory, as proposed by Sara Walker and Lee Cronin.[40] Assembly Theory measures the complexity of an object based on how many assembly steps—or evolutionary layers—it took to construct, effectively measuring its "age" in terms of depth in time. This perspective highlights how systemic complexity develops over time, with each step marking a deeper historical trajectory. Rather than being predetermined by initial conditions, this complexity is built through iterative feedback, evolution, and the accumulation of structures across time, or rather, structures of time.[41] Time in this case becomes a memory object made out of matter of the past choices.

Assembly theory rethinks information theory in two ways, which this chapter defines as vertical and horizontal. The vertical approach reconsiders information by quantifying entropy, measuring the number of recursive steps or operations (known as assembly pathways) needed to construct a complex object from basic components.[42] Unlike Shannon's entropy, which measures uncertainty in a system's possible states, assembly focuses on the causal memory embedded in an object's formation. The assembly index—the minimum number of steps required to form an object—captures its complexity and historical contingency, reflecting how much selection and structure were necessary to produce it over time. Alongside this, the copy number—the frequency with which an object can be assembled—works together with the assembly index. Objects with high copy numbers are simpler and more common, while those with lower copy numbers are more complex and rare, indicating the specificity of their assembly pathways.[43] Together, these measures reveal both how often an object is produced and the memory of its formation. In short, the object's formation history becomes embedded in-formation.

The horizontal rethink concerns the flow of information. Rather than merely transmitting data, information in Walker's framework moves across different scales, organising

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[40] Sara Imari Walker, Leroy Cronin, Alexa Drew, Shawn Domagal-Goldman, Theresa Fisher, Michael Line, and Camerian Millsaps. "Probabilistic Biosignature Frameworks." In *Planetary Astrobiology*, edited by Victoria Meadows, Giada Arney, Britney Schmidt, and David J. Des Marais. Tucson: University of Arizona Press, 2019. https://doi.org/10.2458/azu_uapress_9780816540068-ch018.

[41] Abhishek Sharma et al., "Assembly Theory Explains and Quantifies the Emergence of Selection and Evolution," *Nature*627, no. 7968 (October 2023): 613–618, doi:10.1038/s41586-023-06600-9.

[42] Ibid.

[43] Ibid.

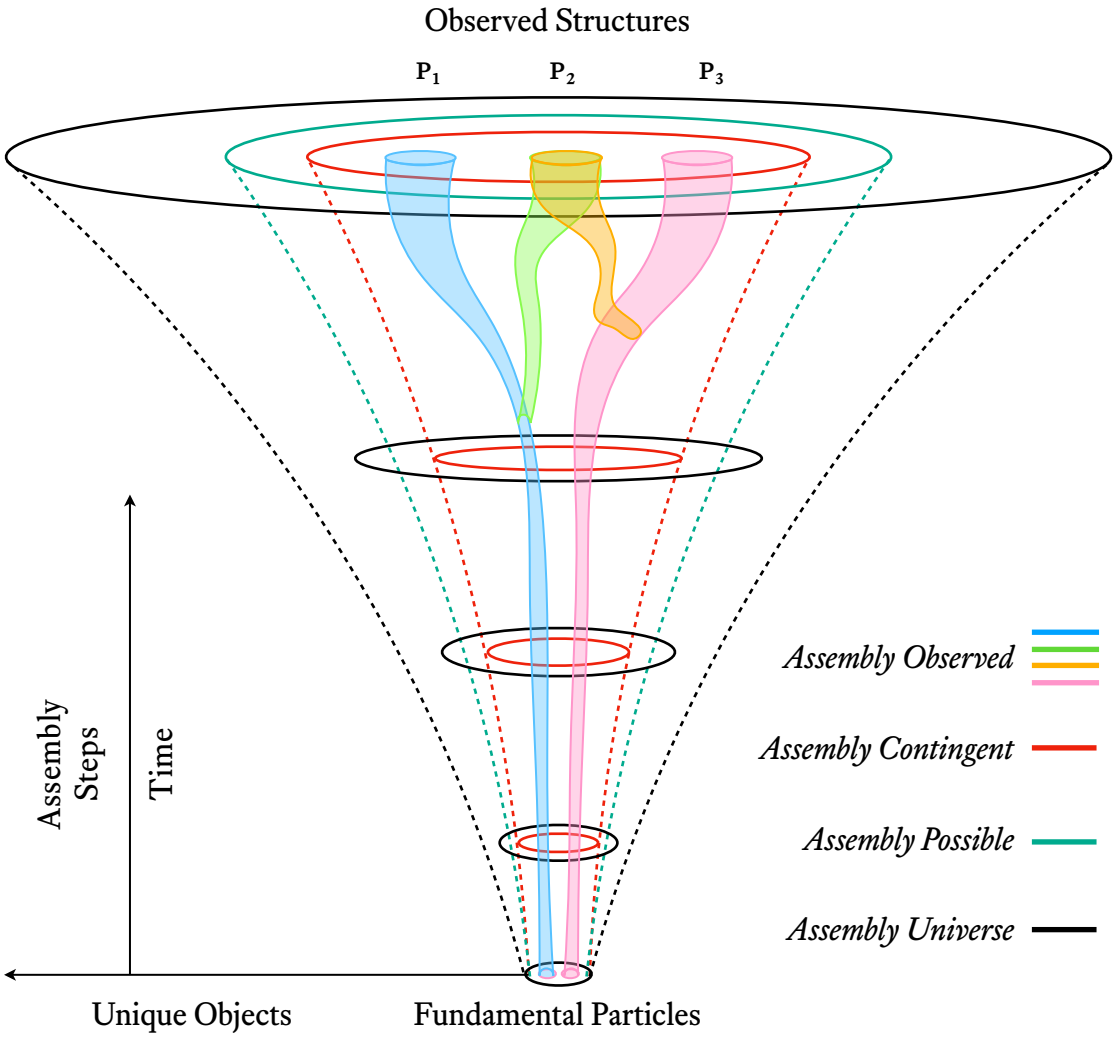

FIGURE 3.2: Diagram of the expansion of Assembly Spaces, reproduced after Sharma et al., "Assembly Theory Explains and Quantifies the Emergence of Selection and Evolution".

complex processes like metabolism and compartmentalisation. These flows of information enable life to evolve recursively, operating through hierarchical structures that range from molecular interactions to planetary systems. For Walker, the system's aliveness is related to the system's dynamic use of information and being capable of its mobilisation.[44]

One could reasonably argue that the logic here bears affinity with Yuk Hui's account of contingency, in which recursivity functions not simply as a conduit for external randomness but as a structural mechanism through which contingency is integrated, opening the possibility of internal transformation. From this perspective, novelty arises within systems not by accident but through their recursive capacity to incorpor-

[44] Sara Imari Walker, *Recursive Worlds* (lecture, Antikythera's Cognitive Infrastructures Studio, London, July 2024).

ate randomness into the dynamics of self-organisation. Unlike technical objects bound by linear causality, recursive processes in AI systems can assimilate perturbations and irregularities, thereby generating new configurations and forms. Hui's account insists that recursivity does not abolish contingency but incorporates it as an intrinsic feature of systemic organisation.[45] Yet this very move risks reabsorbing contingency into a dialectical framework: contingency is not eliminated but becomes productive insofar as it reinforces recursive processes themselves.

A comparable logic is at work in Assembly Theory, where evolutionary novelty is formalised as a sequence of assembly steps, and in Agüera y Arcas's concept of computational life, where recursive computation and feedback are taken as the generative engines of living systems. In both cases, contingency is retained, but only as a resource to deepen the logic of recursivity, rather than as a force capable of rupturing it.

iii. Assembled telogenesis versus Hegelian teleology

Both Assembly Theory and Agüera y Arcas's notion of computational life present non-deterministic frameworks, in which randomness and choice operate as central drivers of change, rather than outcomes reducible to initial conditions. They put emphasis on the role of historical contingency and production of uncertainty woven into recursive choices that shape the assembly pathways. However, a central philosophical question raised by both Assembly Theory and Agüera y Arcas's notion of computational life is whether such material frameworks inevitably tend toward a form of self-assembled teleological determinism, in which the system evolves through its own history of choices and constructions yet remains bound by the probabilistic horizon of its unfolding trajectory. Put differently, the question is whether local telegenesis scales up to a broader topological teleology. From this perspective, the ontology of the system would remain bound to its genealogy, unfolding through mutations, recursive feedback loops, and ultimately systemic tipping points. Moreover, it would mean that the system's actions could only be a functionalist expression of its evolutionarily assembled inherent potentialities. This translates into a system whose ontology is defined to its informational substrate—what it has been made of, layer by layer, through a process of evolutionary complexity.

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[45] Yuk Hui, *Recursivity and Contingency* (London: Rowman & Littlefield International, 2019).

Seemingly, this version of teleology differs from Hegel's, where the dialectical process moves history forward through synthesis of ontological contradictions, leading to sublation (*Aufhebung*) of a concept in both local and transcendental senses.[46]

Hegel views time as integral to the dialectical process. Time represents the medium through which contradictions unfold and resolve themselves. It allows the process of dialectical unfolding to occur, as it is through temporal progression that contradictions are negated and sublated. In Hegel's view, time is the "negation of negation" because it arises from the contradictions within space. Space is pure continuity, but time disrupts this by introducing moments that are distinct and constantly changing. Each moment is negated by the next, creating a dynamic process of becoming. Thus, time negates the continuous nature of space and, through ongoing transitions, negates itself.[47]

To compare, in Assembly Theory and in Walker's view in particular, time is treated as an *object* that forms the fabric of reality, making up the material basis of everything that exists.[48] Time, in this sense, is the matter through which all processes unfold. Self-assembled teleology might seem oxymoronic at first because of the absence of the goal of the Absolute. However, the evolutionary thresholds that constitute the systemic phase transitions could be interpreted as localised teleologies. In Walker's view, thresholds are where systems transition from random processes to structured, information-driven complexity. One such threshold is the origin of life, representing a phase change where

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[46] Sublation involves simultaneous negation (dialectical tension of thesis and antithesis), and preservation (simultaneity), resulting in a higher unity. The Absolute is the final stage where all contradictions are reconciled, and sublation drives this process by transforming finite moments into parts of a coherent whole. The "Absolute" is the ultimate reality or truth that comprehends and integrates (but not annihilates) all contradictions and differences.

G. W. F. Hegel, *Phenomenology of Spirit*, trans. A. V. Miller (Oxford: Oxford University Press, 1977), §§79–82.

[47] Nicholas Bergen, *The Time of Life and the Life of Time: An Articulation of the Problem of Time and Eternity in Hegel and Two Attempts to Resolve It*. Thesis, Georgia State University, 2023. https://doi.org/10.57709/35687632.

[48] Sara Imari Walker and Lee Cronin, "Time Is Not an Illusion: It's an Object with Physical Size," *Aeon*, February 2, 2022, https://aeon.co/essays/time-is-not-an-illusion-its-an-object-with-physical-size.

life moves from simple, chance-based interactions to a self-sustaining, evolving system.[49]

Agüera y Arcas highlights that evolutionary thresholds create new niches by generating opportunities for sub-replicators to emerge within more complex systems. At these moments, systems undergo phase changes—such as when simple random interactions evolve into structured, self-replicating forms. These transitions, like the incorporation of mitochondria into eukaryotes or brainfuck programs generating functional code, form new ecological spaces where symbiotic relationships or new layers of complexity arise.[50]

The advantage of this evolutionary phase transition is that at every moment of replication the system does not need to invent everything from the beginning but navigates randomness from the point of structural semi-stability made out of the matter of the past, for example, members of particular species produce offspring that resembles them rather than the universe going through all the evolutionary stages again. It means that systems can build upon themselves in increasingly complex ways, relying on recursive processes and inherited information.

Benjamin Bratton calls it a moment of artificialisation — a moment when contingency collapses into path-dependency. For Bratton, that collapse is a double-sided move — certain possibilities close down and new ones open up.[51]

In these analytical frameworks, phase change is viewed vertically as an emergent evolutionary process that serves as both an ontological shortcut—replicating a pre-existing complex structure—and a synthetic unity that encompasses its constituent parts. This approach is powerful in capturing evolutionary continuity and the layering of complexity, yet it does not articulate how radical systemic shifts might occur in the immediacy of the present.

The question at hand is whether contingent novelty is necessarily granular or fractal, inscribed within the recursive dynamics of path dependencies that culminate in a topo-

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[49] Sara Imari Walker, *An Informational Theory of Life*, lecture presented at The Long Now Foundation, Fort Mason Center, San Francisco, April 1, 2025, https://longnow.org/o/02025/sara-walker-an-informational-theory-of-life/.

[50] Blaise Agüera y Arcas, *What Is Intelligence?*, lecture presented at Antikythera's Cognitive Infrastructures Studio, London, July 2024.

[51] Benjamin Bratton, "Cognitive Infrastructures: Synthetic Intelligence in the Wild," lecture, Central Saint Martins, London, July 3, 2024.

logical phase shift upon reaching a critical tipping point—thus implying a phase transition through causal sedimentation—or whether there exists the potential for a more profound, systemic topological transformation that exceeds the constraints of path-dependent recursivity.

Since both Assembly Theory and Blaise Agüera y Arcas's work describe organic and synthetic systems forming distributed cognitive infrastructures, it is crucial to explore how change occurs within these frameworks, particularly regarding radical emergence outside the system's probabilistic pathways and predetermined evolution.

Assembly Theory accounts well for vertical thresholds, where complexity accumulates through successive assembly steps and the emergence of new replicators. This framework is powerful for tracing evolutionary depth, capturing how structures build upon prior structures to encode time in matter. What it does not adequately address are horizontal transformations, where the very mode of replication shifts — whether slowing down, accelerating, closing to contingency, or opening into new dynamics. These shifts are not reducible to the accumulation of assembly steps, but instead mark a reorientation of the system's dynamics, altering the conditions under which novelty can (or cannot) emerge.

Understanding these possibilities (and their logic) is essential for investigating how such emergence of radical change could contribute to, for example, the degeneration or homogenization of systems, or, quite the contrary, refolding political structures and (in)formational flows by confronting and reshaping embedded exclusionary violence.

3.2. Logics of novelty: stochasticity, derivation and autocompletion

It could have happened.
It had to happen.
It happened earlier. Later.
Nearer. Farther off.
It happened, but not to you.

Could Have, Wisława Szymborska

i. Generative complex systems: derivation and stochasticity

To understand how radical transformations, such as phase transitions or the emergence of novel phenomena, occur within complex systems governed by entrenched path dependencies, it is essential to explore the interplay between novelty, complexity, and a form of systemic uncertainty. This uncertainty has been approached in various ways throughout the argument, provisionally following the terminology and frameworks of the referenced thinkers, and has been conceptualised as randomness, noise, mutation, contingency, error, accident, or incompleteness. While these notions are interrelated, they each follow distinct, sometimes contradictory logics.

Generative allopoietic capabilities—the ability to create entities that are not mere replicas of the system itself, or to produce without adhering strictly to predefined algorithms—are key characteristics of intelligent systems.[52] As discussed in Chapter 1, intelligence is a distributed large system phenomenon, not a property of individuals or species. This does not imply that planetary intelligence is merely an aggregate of various forms of cognitive infrastructures—such as a relationally interconnected triad of animal, human, and machine systems. The matter and logics of intelligence are a planetary endeavour, meaning that it is not a localised, isolated miracle. Rather, it requires the space of possibilities of the entire planet, deep time of multiple recursive structures and contingency to experimentally come up with conditions suitable for emergence of behaviour that can be understood as intelligent.

In the context of planetary intelligence and Agüera y Arcas' work discussed before, the relationship between complexity and novelty might appear straightforward: as com-

[52] The word "allopoietic" is used here in the same way as it was introduced by: Humberto R. Maturana and Francisco J. Varela, *Autopoiesis and Cognition: The Realization of the Living* (Dordrecht: Reidel, 1980), 137.

plexity increases, the potential for novelty seems to grow, offering more possibilities for new patterns to emerge. However, in reality, this relationship is far more intricate. Increasing the number of elements and interactions does not automatically lead to greater novelty, and radical novelty does not always arise from complexity or exhibit complexity itself.[53] In fact, novelty can emerge from simple interactions or through a system's unique ability to reduce complexity (compression), challenging the assumption that more complexity inherently fosters more novelty.[54]

There are several definitions of complexity relevant to this discussion, each based on a different analytical logic. This chapter distinguishes and engages with three forms of complexity: emergent, informational and dynamic. Emergent complexity is related to the non-reducible features that cannot be deducted from the systemic interactions or a sum of systemic components.[55] Informational complexity is a quantitative description providing the minimal information required to capture all systemic elements and their relationships, as well as the overarching structure.[56] Dynamic complexity describes a phase space of a system, considering its evolution over time, describing the potential for non-linear interactions, feedback loops, and chaotic behaviours.[57]

Novelty within synthetic generative AI systems is framed by the widespread dismissal of AI as inherently regurgitative.[58] The popular accusation that AI functions as a "stochastic parrot" is intricately bound to the characterisation of AI as fundamentally derivative or re-combinatorial.[59] Although synonymous in common speech, those features operate differently. Rather than trying to prove the capability of AI to create nov-

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[53] Teppo Felin and Stuart Kauffman, "The Search Function and Evolutionary Novelty," SSRN Scholarly Paper (Rochester, NY, October 25, 2019), https://doi.org/10.2139/ssrn.3468246.

[54] Casper van Elteren, "Three Myths in Complexity Science – and How to Resolve Them," *arXiv preprint* arXiv:2407.01762 (revised November 17, 2024), sec. "Complex Systems and Emergent Novelty.

[55] P. W. Anderson, "More Is Different," *Science* 177, no. 4047 (1972): 393–96.

[56] Seth Lloyd, "Measures of Complexity: A Nonexhaustive List," *IEEE Control Systems* 21, no. 4 (2001): 7–8.

[57] Prigogine, Ilya, and Isabelle Stengers. Order Out of Chaos: Man's New Dialogue with Nature. New York: Bantam, 1984.

[58] Anirban Mukherjee, "Psittacines of Innovation? Assessing the True Novelty of AI Creations." arXiv, 2024. https://doi.org/10.48550/ARXIV.2404.00017.

[59] Mukherjee, "Psittacines of Innovation?"

el outputs, it is worth examining the logic of those accusations in relation to AI systems.

Differentiating these close but distinct transformative logics is not merely semantic but essential: *stochastic* methods rely on randomness in their processes, *probabilistic* methods explicitly model uncertainty through probability distributions, *derivative* methods guide optimisation by quantifying how small changes affect outcomes—similar to how financial derivatives respond to changes in the underlying asset, and recombinatorial operations rearrange pre-existing elements into novel configurations.[60]

Understanding those nuances becomes crucial in addressing critiques that synthetic systems, particularly LLMs, are incapable of genuine novelty. If that was true, the system's capacity for novelty would be deeply entangled with its functionalist structure, and radical change or departure from entrenched biases would not be possible within this deterministic, informational ontology. The serious implication of this critique is that systems are bound to replicate exclusionary logics, especially if trained on biassed datasets, raising concerns about their potential to surpass their informational past. Those AI characteristics will be analysed in the following section.

Recombinatorial logic suggests that AI systems function by rearranging pre-existing components—but this is a misleading oversimplification. While certain approaches like genetic algorithms employ recombination, they do so through a structured process of selection and variation, not mere collage-like shuffling.[61] More importantly, modern connectionist AI, particularly deep learning, cannot be framed as strictly recombinatorial. Neural networks operate in embedding spaces, capturing geometric regularities and latent structures in data, not by recombining discrete tokens, but by learning con-

[60] This taxonomy of logics is an original distinction, but it is grounded in existing analyses of stochastic, probabilistic, derivative, and recombinatorial methods. For stochastic and probabilistic approaches, see Judea Pearl, *Causality: Models, Reasoning and Inference*, 2nd ed. (Cambridge: Cambridge University Press, 2009). For derivative logic, see Gerald Nestler, Christian Kloeckner, and Stefanie Mueller, "The Derivative Condition | Aesthetics of Resolution | Renegade Activism by Gerald Nestler – Issuu," May 8, 2020, https://issuu.com/gerne/docs/2019_publikation. For recombinatorial operations, see Lev Manovich, *Software Takes Command* (New York: Bloomsbury, 2013).

[61] Dirk Sudholt, "How Crossover Speeds Up Building-Block Assembly in Genetic Algorithms," *Evolutionary Computation*22, no. 2 (2014): 231–53, https://doi.org/10.1162/EVCO_a_00107

tinuous transformations in vector space.[62] Embeddings thus enable abstract pattern and relational representation, revealing that to think of AI as merely patching together bits of existing material fundamentally misunderstands how these systems work.[63]

The accusation of being *"derivative"* carries more weight, but misses the role of derivatives in AI processes. Mathematical derivatives are important for AI learning, forming the basis of optimisation logic by guiding models in adjusting parameters to minimise loss.[64] This logic is central to gradient descent discussed before. In deep learning, backpropagation uses derivatives to update neural network weights. Similarly, in reinforcement learning, policy gradients use derivatives to optimise decision-making by adjusting an agent's policies—strategies for actions in different states—based on expected rewards. This process fine-tunes the policies by calculating how changes affect outcomes, ensuring more effective decision-making over time.[65]

Derivative logic, however, extends beyond its mathematical application. Gerard Nestler introduces the notion of the Derivative Condition to describe the intersection of derivatives, algorithmic infrastructures, and temporality. Drawing from their application in finance, Nestler argues that derivatives, through increasing algorithmic use, extend beyond financial markets to reshape various aspects of life and politics. This

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[62] Na Lei, Zhongxuan Luo, Shing-Tung Yau, and David Xianfeng Gu, *Geometric Understanding of Deep Learning* (2018).

[63] Yoshua Bengio, Aaron Courville, and Pascal Vincent, "Representation Learning: A Review and New Perspectives," *IEEE Transactions on Pattern Analysis and Machine Intelligence* 35, no. 8 (2013): 1798–1828. https://doi.org/10.1109/TPAMI.2013.50.

[64] Ian Goodfellow, Yoshua Bengio, and Aaron Courville, *Deep Learning* (Cambridge, MA: MIT Press, 2016), 200–210.

[65] Madry Lab, "A Closer Look at Deep Policy Gradients (Part 1; Intro)," gradient science, accessed September 22, 2024, https://gradientscience.org/policy_gradients_pt1/.

algorithmic imperative recirculates the past into the future, collapsing the exploratory potential of the present.[66]

In his doctoral thesis, *The Derivative Condition: A Present Inquiry into the History of Futures*, Nestler contends that algorithms in the quantitative production of risk have transcended traditional market regulations, influencing broader socio-political structures. This shift transforms social relations through the imposition of quantitative imperatives. The Derivative Condition suggests a temporal distortion, where the past is instrumentalized to manage future uncertainties, reducing the future to a quantified, controllable risk. Consequently, the present becomes uninhabitable, trapped within a deterministic feedback loop between past and future.[67]

Nestler's view contrasts sharply with one of Venkatesh Rao, who argues that the most significant and positive transformation that AI paradigm shift brings is of temporal nature. He suggests that instead of seeing AI as purely about artificialisation of intelligence or as a path to "superintelligence," it should be better understood as *Artificial Time*. According to Rao, modern AI systems operate in "superhistory," logging and processing information at an accelerated pace, far exceeding human capacity. This superhistorical accumulation allows AI to augment human experience, making individuals older in time, and more knowledgeable than their biological age through machine-augmented learning. He claims that this is different from civilisational accumulation because institutional preservation of knowledge is selective and ineffective in comparison to AI's indiscriminate and rapid processing. In Rao's view, the multiplicity and the amount of raw data collected over time makes the fear of bias captured in data exaggerated.

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[66] *"While the past succumbs to a stochastic reservoir for the quantification of future events, the present vaporises in the actualisation of the one price realised from the myriads of virtual prices that "inhabit" these volatile "galaxies" of risk options. These quickly fading "bodies" – the material embodiment of optionality – include a commodity termed the human capital. Thus, in what I call the derivative condition, contingent futures rendered as claims produce subjectivities and their relations that at the same moment "collapse"; it is the present – in which subjectivity and agency are born in the first place – which decays in microseconds."*
Gerald Nestler, *The Derivative Condition. A Present Inquiry into the History of Futures* (Goldsmiths 22 University of London Ph.D. submission in Research Architecture 1, 2016).

[67] Ibid.

> "This is because AIs rapidly outgrow the potential of accumulated human experience as models grow in size and richness. Their growing non-humanness eventually overwhelms their inherited human biases."[68]

In Rao's view, the radical refolding concerns the accessibility of deep, multi-layered time through AI, allowing for temporal augmentation via inference from a single computer. This augmentation, achieved through prompting, resurfaces various histories and timelines, effectively transforming time into a malleable material. This restructuring enables accelerated reinterpretation and change, not only for AI models but also for those interacting with them, thereby making temporal complexity more manipulable in unprecedented ways. Instead of Nestler's idea of erasing the present, Rao argues that AI expands it by granting extended access to both the past and alternate timelines.

However, individual inference in Rao's vision seems to overlook the fact that accessibility of information and various temporal resources is not tantamount to in-corporation of that time. As discussed in Chapter 1, that does not need to imply physical internalisation but requires a systemic transformation.

ii. Large language games: structuralism and predictive assemblage

Understanding the temporal logic of stochastic systems depends on distinguishing stochastic from probabilistic approaches, and on treating stochasticity as a process.

Stochastic AI refers to models and algorithms that incorporate randomness into their processes, affecting aspects like weight initialisation, decision-making, and exploration (where random actions are employed to investigate possible strategies).[69] These systems depend on probability distributions, which allow for variable outcomes even with the same input conditions. Contemporary AI models, such as those employing reinforcement learning, generative models, and neural networks rely on stochastic processes.

The terms *probabilistic* model and *stochastic* model are closely related but have distinct meanings. Both involve randomness, but they differ in how these elements are used.

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[68] Venkatesh Rao, "Superhistory, Not Superintelligence," February 18, 2023, https://studio.ribbonfarm.com/p/superhistory-not-superintelligence.

[69] H. T. Banks, K. L. Cook, and H. K. Kim, "A Comparison of Probabilistic and Stochastic Formulations in Population Growth Models," *Journal of Mathematical Biology* 59, no. 1 (2009): 135–151.

To highlight the subtle logical difference between these approaches: probabilistic models, a subset of stochastic models, focus on explicitly modelling uncertainty using well-defined probability distributions to predict outcomes. In contrast, *stochastic* models incorporate randomness in their processes but do not always rely on explicit probability distributions to guide their behaviour.[70]

Critiques of AI as a "stochastic parrot" often reduce its dynamic processes to mere artefact production, equating novelty with perceptual surprise at its outcomes. Such arguments frequently overlook critical insights from disciplines like art and media theory, which, particularly since modernism, have rigorously explored the creative process as an integral aspect of the generated outcome.[71] From an analytical perspective, the verification of novelty occurs only within a bounded system, one with its own history and memory that provide the necessary framework for recognizing novelty. In this sense, "the new" is always situated within a systemic reference.

Moreover, this thesis argues that novelty is ontologically perspectival—not because it requires an observer for validation, but because the position of measurement influences the assessment of a pattern as new. A pattern may appear different while being a mere result of movement or topological transformation, understood here in a mathematical sense. Thus, "perspectival" does not imply subjectivity.[72]

The chapter examines novelty through the logic of process, rather than treating it as a static feature of an outcome assessed in relation to systemic priors. Such an approach, however, must avoid the risk of relativising novelty, reducing it to inevitability by sub-

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[70] Ibid.

[71] Cf. Emily M. Bender, Timnit Gebru, Angelina McMillan-Major, and Shmargaret Shmitchell, "On the Dangers of Stochastic Parrots: Can Language Models Be Too Big?" in *Proceedings of the 2021 ACM Conference on Fairness, Accountability, and Transparency* (New York: Association for Computing Machinery, 2021), 610–23, https://doi.org/10.1145/3442188.3445922.

[72] In that sense, novel phenomena can arise even in the depths of a forest with no one there to witness them, echoing the philosophical thought experiment attributed to George Berkeley.

"Although attributed to George Berkeley and present in his philosophy, the well-known phrasing comes from a question formulated by The Chautauquan magazine: "If a tree were to fall on an island where there were no human beings would there be any sound?" It was answered as: "No. Sound is the sensation excited in the ear when the air or other medium is set in motion."

M. Bailey, *The Chautauquan: Organ of the Chautauqua Literary and Scientific Circle*, 1883.

suming it under a rhetoric of perpetual becoming. Emphasising process does not imply that everything is always in flux and thus already new.

This thesis proposes that understanding the generative moment as a *process* necessarily has temporal consequences. To view generation not as an auxiliary process subservient to its result, but as a space-time object-event, implies that what is produced is a form of space-time itself. The following section addresses the accusation of stochasticity, the claim that generative systems operate merely by probabilistic pattern-following without meaningful understanding, by examining the nature of the stochastic process itself.

One might mistakenly assume that the logic of popular generative AI, particularly large language models, represents a structuralist triumph. At first glance, these models appear to produce meaning in ways that echo structuralism's core principles: the presumption of underlying relational patterns within language or code, and the belief that meaning emerges from the tensions between their elements and structures.[73] In the case of large language models, the dataset functions as a foundational system: meaning appears to emerge through the statistical differentiation of token relationships, echoing structuralist linguistics, where meaning is understood to arise from the differences between signs within a closed system. However, large language models operate by *tokenising* text, breaking language down into smaller units known as tokens, which are not necessarily entire words but could be subwords, word fragments, or even individual characters.[74] These tokens are then processed through multiple layers, enabling the model to predict the likelihood of the next token based on statistical patterns derived from the training data. Rather than relying on semantic understanding, the model builds relationships between tokens based on statistical regularities in their distribution, capturing contextual, semantic and syntactic regularities, without referring to the meaning of words. The model's output, therefore, is shaped by probabilistic associ-

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[73] Cf. Ferdinand de Saussure, *Course in General Linguistics*, ed. Charles Bally and Albert Sechehaye, trans. Wade Baskin (New York: Philosophical Library, 1959); and Roland Barthes, *Elements of Semiology* (New York: Hill and Wang, 1968).

[74] Alec Radford et al., *Language Models Are Unsupervised Multitask Learners* (OpenAI, 2019), https://cdn.openai.com/better-language-models/language_-models_are_unsupervised_multitask_learners.pdf

ations within the data. In that sense, meaning is not produced strictly by textual tension.[75]

This section proposes that Large language models (LLMs) cannot be fully classified as structuralist, as their generative processes rely on sequential, context-dependent transitions, in some aspects resembling Markovian logic.[76] In structuralism, meaning arises from the relational differences between elements within a system, often independent of temporal sequence. By contrast, LLMs operate by predicting the next token on the basis of precedence, making their output contingent on the immediate prior context. This transitional dependence, where the model continuously adjusts in response to recent states, places LLMs outside a purely structuralist framework, as meaning is tied to evolving contextual dependencies rather than to overarching relations.[77]

That evolving contextual dependence that weaves meaning in the now well-known autocomplete way resembles Wittgenstein's work on certainty and language games. Wittgenstianian language games signal the impossibility of separation of linguistic assertion from its application: "the speaking of language is part of an activity, or a form of life".[78] That 'application' does not mean singular contextualisation in particular circumstances but rather a particular game, of which the assertion must be a part in order for it to make sense. Those games, for Wittgenstein, are neither purely linguistic nor do they come with ready sets of immutable rules: "[we] make up the rules as we go along".[79] Each game is an expanding ontic system of meaning, and gaming is a way of its onto-logical navigation. This implies that the structure of language is not informa-

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[75] Nived Rajaraman, Jiantao Jiao, and Kannan Ramchandran, "Toward a Theory of Tokenization in LLMs" (arXiv, April 12, 2024), https://doi.org/10.48550/arXiv.2404.08335.

[76] This should not be taken to imply that the overarching logic of LLMs is Markovian.

[77] "The true and unique object of linguistics is language studied in itself and for itself. (…) The linguist must take the state of language as his norm, and recognise therein the system of values existing at a given moment. (…) Linguistics is not to confuse this state with the diachronic changes which time introduces." Cf. Ferdinand de Saussure, *Course in General Linguistics*, ed. Charles Bally and Albert Sechehaye, trans. Wade Baskin (New York: Philosophical Library, 1959), 81–82, 120.

[78] Ludwig Wittgenstein, *Philosophical Investigations*, trans. G. E. M. Anscombe, 4th ed. (Chichester: Wiley-Blackwell, 2009), 23.

[79] Ludwig Wittgenstein, *Philosophical Investigations*, 4th ed. (Malden, MA: Wiley-Blackwell, 2009), 83.

tional, representational or pregiven: "We do not learn the practice of making empirical judgments by learning rules: we are taught judgments and their connection with other judgments".[80] More importantly, gaming introduces motion and change to the ontology of meaning. In that sense, a language game does not assume some kind of a priori systemic set-up to which new elements need to claim affinity in order to obtain meaning. Large Language Models are to some extent Large Language Games.

Because LLMs are not purely Markovian but rely on probability distributions derived from datasets, they require a logic that selects from all possible tokens following the previous one. The temperature parameter modulates this process: lower temperatures drive the model to favour high-probability selections, echoing structuralist tendencies, while higher temperatures introduce greater randomness, allowing for more exploratory outcomes.[81] In both cases, meaning is created contextually. For LLMs, context is defined by precedence that establishes a probabilistic cohesion that links the next token to the previous one.

Because of that, exploration of meaning in LLMs, even in high temperature, is only partially Wittgenstinian. In its temporal positioning, it resembles a version of Derridian logic of différance, especially the part drawing on Husserl's ideas of retention (memory of the past) and protention (anticipation of the future), emphasising that meaning is always deferred and shaped by temporal dynamics.[82] To phrase it in Derrida's terms of traces and haunting, each token in a sequence is shaped by prior tokens as retention traces, which are no longer present but leave spectral imprints that guide meaning, and by future expectations as protention hauntings, which structure anticipation before the next token appears.[83] It could be argued that in LLMs meaning production is to some extent stuck in this Derridian deferral, and therefore never fully occupying the present.

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[80] Ludwig Wittgenstein, *On Certainty*, ed. G.E.M. Anscombe and G.H. von Wright, (Oxford: Basil Blackwell, 1972), 140.

[81] Max Peeperkorn et al., "Is Temperature the Creativity Parameter of Large Language Models?" (preprint, arXiv, May 1, 2024), https://arxiv.org/abs/2405.00492.

[82] Jacques Derrida, *Speech and Phenomena: And Other Essays on Husserl's Theory of Signs*. Translated by David B. Allison. Evanston: Northwestern University Press, 1973.

[83] Jacques Derrida, *Of Grammatology*. Baltimore: Johns Hopkins University Press, 1976.

On the other hand, the main argument against structuralist and post-structuralist interpretation of LLMs is its special relationship to contingency. The difference between AI and other forms of technological automation in their relationship to contingency lies in the fact that contingency itself becomes AI's operational fabric.[84] During AI processes: data analysis, predictive modelling, and adaptive learning, contingency is not an adversarial force but an inherent part of the detected, formulated and updated data distribution. In that sense, the degrees and rhythms of irregularity formulate the pattern of similarity. However, the phrase "contingency" lacks specificity. The following section clarifies and distinguishes between forms of uncertainty used in AI technologies.

[84] Bratton argues that every new form of artificialisation, including the subsequent forms of technological automation, collapses contingency into path dependency through automation. Therefore, technological innovation transforms the cloud of probability into a reproducible approximate path. For example, industrial revolutions invented and introduced large scale control of the environment (Nature) and automated processes previously involved in its transformation. In that sense, they reduced the unpredictability of natural processes. On the other hand, as Thomas Moynihan notices, the increased burning of coal and depletion of natural resources lead to the new forms of climate volatility (the production of the new forms of contingency).

The proliferation of different forms of analytical and generative AI and the paradigm shift that they imply in production, circulation and distribution of meaning follows the patterns of the former industrial revolutions in terms of simultaneous reduction and production of contingency. AI enables finding patterns in data that were intelligible beforehand and early detection of various phenomena: earthquakes, diseases, shifts in financial markets, population changes, infrastructure weaknesses, disruptions to the supply chain, consumption patterns, social fads or various forms of strategised crime. Those predictions facilitated by AIs allow for risk management and introduction of protective measures. On the other hand, AI powered technologies produce new forms of contingency, for example, posing unknown risks as autonomous agents and decision-makers or providing factually incorrect information through hallucination of coherence between unrelated data points.

Bratton Benjamin, "Cognitive Infrastructures" (London, June 24, 2024), and Thomas Moynihan, "Planetary Sapience & Planetary Stupidity: A Bildungsroman for the Baby Noosphere" (Antikythera Lecture Series, London, September 7, 2024).

3.3. Synthetic uncertainties: difference between randomness and undecidability

> *I coined a term on @machinekillspod that I feel like needs its own essay: Habsburg AI – a system that is so heavily trained on the outputs of other generative AI's that it becomes an inbred mutant, likely with exaggerated, grotesque features. It joins the lineage of Potemkin AI.*[85]
>
> Sadowski, Jathan (@jathansadowski)

Synthetic systems designed to generate novel outputs or behaviours often rely on randomness, which is applied instrumentally across various tasks in artificial complex systems. As previously discussed with Monte Carlo methods, randomness is used to simulate unpredictable real-world phenomena, such as market fluctuations. In reinforcement learning, randomness allows agents to explore diverse strategies, avoiding repetitive behaviours. In stochastic gradient descent discussed before, it prevents models from getting stuck in local minima and reduces overfitting.[86]

Overfitting happens when a model displays over fidelity to the training set and fails to generalise.[87] Most critically, in generative models, randomness introduces variation, for example, in large language models, techniques like temperature scaling allow for controlling the predictability of outputs during text generation.[88]

Randomness can be defined as unpredictable variability within a system, where values or processes do not strictly follow predictable paths. In artificial systems, it is typically introduced through random number generators or probabilistic algorithms, which cause controlled fluctuations in the system's behaviour. These fluctuations are integ-

[85] Jathan Sadowski, Twitter post, February 13, 2023, 10:29 p.m., https://twitter.com/jathansadowski/status/1625333221879832576.

[86] Shibhansh Dohare, Richard S. Sutton, and A. Rupam Mahmood, "Continual Backprop: Stochastic Gradient Descent with Persistent Randomness" (arXiv, May 5, 2022), https://doi.org/10.48550/arXiv.2108.06325.

[87] IBM, "What Is Overfitting?", *IBM Think*, October 15, 2021, https://www.ibm.com/topics/overfitting.

[88] Joshua Noble, "What Is LLM Temperature?," *IBM Think*, December 16, 2024, https://www.ibm.com/think/topics/llm-temperature.

rated into the system's decision-making processes, allowing the system to diverge from a strictly linear or repetitive trajectory.[89]

The logic of the application of randomness in the examples enumerated below is to simulate uncertainty without introducing its destabilising potential. Crucially, that simulated uncertainty or unpredictability is not a singular property of the real-life world. It escapes a neat definition, being described as a "continuum that ranges from the absolute certainty to the impossibility".[90] Uncertainty as a symptom of many systemic properties, encompasses a broad range of properties of the interconnected dynamics of real life infrastructures, such as the multitude of uncomputable variables, shifting perspective-related pattern cohesions, noise of the physical signals or systemic incompleteness.

Therefore, uncertainty does not always mean indeterminacy or incompleteness, as formalised in Kurt Gödel's incompleteness theorem, which has nuanced implications for mathematics, computer science, philosophy and politics. Gödel demonstrated (through Gödel numbering and self-referential statements) that in any sufficiently complex mathematical system, it is impossible to prove all true statements.[91] Moreover, the system cannot internally demonstrate its own consistency.

In computability theory, indeterminacy connects to decision problems, where it is impossible to design an algorithm that always provides a correct yes-no answer for all inputs. The classic example is Turing's halting problem, which shows that it is undecidable whether a program will halt or loop indefinitely, given its input and formal description.[92] Alan Turing proved that no universal algorithm (or "decider") can determine this behaviour for every possible program. Here, indeterminacy is distinct

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[89] Mario Stipčević, "Randomness: What Is It and Why Does It Matter?" *arXiv*, March 14, 2023, https://arxiv.org/abs/2303.08057.

[90] Horacio Paggi and Fernando Alonso Amo, "Uncertainty and Randomness: A Holonic Approach," in *2010 Second International Conference on Computer Engineering and Applications* (2010 Second International Conference on Computer Engineering and Applications, Bali Island, Indonesia: IEEE, 2010), https://doi.org/10.1109/iccea.2010.245.

[91] Kurt Gödel, *On Formally Undecidable Propositions of "Principia Mathematica" and Related Systems*, New edition (New York: Dover Publications Inc., 1992).

[92] Thomas H. Cormen et al., *Introduction to Algorithms*, 4th ed. (Cambridge, MA: The MIT Press, 2022), 210

from uncertainty or ambiguity, it asserts that a problem is unsolvable in principle, not merely beyond current knowledge or technology.[93]

The fact that a system can never form a logically contained self-sufficient set of axioms that express all the systemic "truths" has nuanced consequences. Even if interpreted most modestly, as a logical-formal paradox rather than a mathematically discovered property of the real world systems, it quickly shifts from the epistemic to ontological. Markus P. Müller illustrates this through the example of Euclid's parallel postulate: it was "true" but for centuries, mathematicians tried to derive it from the other axioms of geometry and failed, eventually leading to the discovery of alternative geometries like hyperbolic and elliptic.[94] This shows that within certain systems, some questions are undecidable because they cannot be proven or disproven within the system's existing axioms.[95] The undecidability in this case is not a failure of reasoning but an inherent feature of the system, revealing that different models of reality emerge depending on which additional axioms or assumptions are adopted. This demonstrates how undecidability points to the multiplicity of possible structures rather than an epistemic limit. Müller's argument makes it about "models" but his simple example reveals the blurring boundary between invention and discovery.[96] This thesis argues that what Euclid's parallel postulate proof shows is that "the new"is not always a consequence of recursive feedback but finding a novel transformative logic that allows to see/fold the already known system in an entirely different way. The incompleteness principle is

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[93] Indeterminacy also differs from non-computability which is sometimes understood as a result of feeding infinite value into the program (Sabine Hossenfelder) or describing a more elementary feature of human consciousness at the neural level (Penrose). In contrast to non-calculability, incalculability colloquially means insufficient information to solve a problem. Mathematically, it refers to effective (non) calculability meaning that there is not an algorithm that could calculate values for the function.

[94] Euclid's parallel postulate asserts that for any given line and a point not on that line, there exists exactly one line through the point that remains parallel to the original line. Unlike the other postulates in Euclid's *Elements*, this one resisted proof from the remaining axioms. Eventually, it was recognized as independent, leading to the development of non-Euclidean geometries.

[95] Markus P. Müller, "Undecidability and Unpredictability: Not Limitations, but Triumphs of Science," in *Undecidability, Uncomputability, and Unpredictability*, ed. Aguirre, Anthony, Brendan Foster, and Zeeya Merali (Cham: Springer, 2021), 5-14.

[96] Robert B. Laughlin, A Different Universe: Reinventing Physics from the Bottom Down (New York: Basic Books, 2005).

a formal proof of that topological transformative capacity. Moreover, as this chapter will further argue, the apparent non-belonging or "frustration" of elements within an otherwise provable set may signal the emergence of a new, as-yet undefined logic operating within the system itself.

In quantum mechanics, indeterminacy reveals another crucial feature: simultaneity. Quantum indeterminacy refers to the fundamental physical incompleteness of isolated quantum systems, exemplified by the Heisenberg Uncertainty Principle.[97] It is impossible to simultaneously know both the position and momentum of a particle, such as an electron, or predict its precise future location. Indeterminacy resolves when a quantum entity interacts with its environment, leading to the collapse of the probability cloud. Superposition suggests that prior to measurement, a quantum system exists in multiple states simultaneously. Indeterminacy here does not indicate the limits of human knowledge but a fundamental feature of how, as Carlo Rovelli suggests, "the quantum world works".[98] Possibility, in this ontological register, is not a cloud of potential awaiting actualisation, but a state that may comprise multiple, even contradictory, logical configurations.[99]

The potential for a system to reconfigure itself according to an alternate logic, without the need for external input or intervention, implies that novelty within systemic knowledge is inexhaustible and does not necessarily happen through re-mixing. This stands in opposition to the anxieties surrounding "data starvation," "autophagy," "poisoning," "pollution," and so-called "Habsburg AI".[100] These interrelated concepts describe the degradation of AI systems when they exhaust high-quality data, leading to overfitting and a reliance on self-referential feedback. This self-consuming cycle incorporates errors, recirculating them until the system collapses into an informational inbreeding.

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[97] David J. Griffiths, *Introduction to Quantum Mechanics*, 2nd ed. (Upper Saddle River, NJ: Pearson Prentice Hall, 2005), 109–113.

[98] Carlo Rovelli, *Reality Is Not What It Seems: The Journey to Quantum Gravity*, (New York: Riverhead Books: 2017).

[99] Carlo Rovelli, *Helgoland: Making Sense of the Quantum Revolution*, trans. Erica Segre and Simon Carnell (London: Penguin, 2021), 14.

[100] As noted by: Xiaodan Xing et al., "When AI Eats Itself: On the Caveats of Data Pollution in the Era of Generative AI" (arXiv, July 25, 2024), https://doi.org/10.48550/arXiv.2405.09597.

While these concerns are valid when data quality and diversity are crucial, they stem from a static, extractive and localised view of data, treating it as a finite resource. This position also assumes there is a limited amount of meaningful information to be found in a dataset. This perspective fails to account for the potential to reinterpret information or activate it in a different way in the intersystemic dynamic, allowing systems to evolve and sidestep collapse.

Systemic incompleteness suggests that organic, synthetic, or political systems can take a "logical leap" rather than simply reproduce themselves in an unchanged way, or change through the forms of recursion.[101] However, it is important to clarify that a logical leap does not imply some miraculous, law-defying event within an otherwise static system. Incompleteness does not suggest the existence of hidden, impenetrable mysteries within matter. Neither does it suggest that systems are fundamentally unpredictable. This interpretation aligns more closely with Object-Oriented Materialism, a view this argument should not be conflated with or mistaken for.

[101] The idea of a "logical leap" does not refer to any established concept and is developed in the next section.

3.4. Logical Leap: phase change and topological transformation in complex adaptive systems

i. Cascading propagation: accident and contagion

There is a danger of misinterpreting incompleteness as undermining the significance of individual agency and the necessity of adopting a political stance. While it is true that every system contains the potential for radical transformation, this does not imply that this logical leap is inevitable. Various systemic factors can make shifts, changes, and the expansion of meaning difficult, undesirable, or even dangerous. It is therefore crucial to examine what kinds of systemic leaps are enabled or facilitated by AI infrastructures, particularly when operating at scale.

That logical leap shows similar logic to something that Malabou's calls an accident. It is a form of an event radically changing the system, introducing plasticity that opens up an irreversible ontological transformation.[102] "Radically" is used here not to describe intensity or scale but in relation to the "root" meaning of the word. Malabou's accident interrupts the systemic unfolding of existence with the transformative interruption of an accident. On one hand, "*In time*, one eventually becomes who one is; one becomes only who one is. Bodily and psychic transformations do nothing but reinforce the permanence of identity, caricaturing or fixing it, but never contradicting it"; however, "We must all of us recognize that we might, one day, become someone else, an absolute other, someone who will never be reconciled with themselves again, someone who will be this form of us without redemption or atonement, without last wishes, this damned form, *outside of time"* [emphasis mine].[103] Malabou's "outside of time" does not mark a form of externality but a break, "cut" in systemic continuity. The error, bug in a code or mutation enabled through recursivity is similar to the first logic described by Malabou that happens "in time", a phase transition would be a part of the destructive-transformative force of plasticity.

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[102] *"Transformation would no longer be a trick, a strategy or a mask always ready to be lifted to reveal the authentic features of the face. Transformation would betray an existential underground, which, beyond the round of metamorphoses, would enable the subject to become unrecognisable. Unrecognisable less because of a change in appearance than on account of a change in nature, a molting of the inner sculpture."*
Catherine Malabou, *The Ontology of the Accident: An Essay on Destructive Plasticity* (Cambridge: Polity Press, 2012), 1,2.

[103] Malabou, *The Ontology of the Accident*, 2.

AI technologies articulating and articulating *with* preexisting infrastructures initiate that transformative plastic change often mistaken for mere technological upgrade.

The mainstream critiques of earlier algorithmic and AI technologies that position them as the culprit behind contemporary radicalisation, social divisions and spread of conspiracy theory, point out that feedback on a planetary scale, as well as accelerated time of media production and circulation leads to political volatility.[104] Chapter 1 signalled the problem of authenticity of simulacra in the context of deep fakes and conspiracy theories. Chapter 2 scrutinised the meaning production in multimodal text-to-image generators, Section 1 and 2 of this chapter looked into logics of circulation and meaning production in the LLMs. This section focuses on circulation at a scale, investigating how things spread in synthetic systems, and more importantly, through the planetary cognitive infrastructures, addressing the problem of radicalisation chambers and "virality" of fads.

Radicalisation, abstracted from its immediate political implications, follows a systemic logic of positive feedback that reinforces and amplifies existing tendencies, leading to homogenisation. In this process, initial variations are diminished as feedback loops strengthen dominant patterns, eventually causing a convergence toward uniformity within the system. As this homogenisation progresses, it reduces the diversity of responses and interactions, making the system increasingly susceptible to a network cascade, where small triggers can lead to large-scale shifts in behaviour or structure. It is the eradication of diversity through local recursion.[105]

The application of virality and epidemiological models to financial and political phenomena has seen significant amplification, particularly with the Covid-19 pandemic. The pandemic revealed parallels between the dynamics of biological contagions and the mechanisms of propagation within financial, cultural as well as digital and technological ecosystems, drawing attention to the interdependencies and vulnerabilities in complex, networked systems. One of the most refined formulations of the logic of contagious circulation can be found in Benjamin Bratton's *Revenge of the Real*. Bratton's reading of the epidemiological model, informed by Foucault's biopolitics, extends this understanding to global connectivity, where viral transmission captures the ways local

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[104] Cf. Dan McQuillan, Resisting AI: An Anti-Fascist Approach to Artificial Intelligence (Bristol: Bristol University Press, 2022).

[105] Brian Castellani and Frederic W. Hafferty, Sociology and Complexity Science: A New Field of Inquiry (Berlin: Springer, 2009), 91–95.

phenomena are deeply intertwined with planetary-scale infrastructures. Bratton argues for a positive biopolitics, where data and technological systems are crucial in managing global collectives. His critique of oversimplified readings of Foucault's work challenges reductive anti-surveillance narratives, insisting that planetary-scale sensing, archiving, data interpretation and governance are essential for addressing global risks.[106]

Bratton's epidemiological view takes into consideration multiple systemic scales and builds on the concept of infrastructural "stack," where global governance and contagion control are understood through interconnected layers of governance, data systems, and technological infrastructures that operate across both physical and digital realms.[107]

This chapter argues that the limitation of contagion as an idea-metaphor describing political circulation lies in the fact that it fails to realise the coexistence of multiple logics that run simultaneously across human and non-human collectives. In the epidemiological model an individual can exist in one of several states: susceptible (not yet exposed to the pathogen), exposed (infected but not yet infectious), infected (either symptomatic or asymptomatic), recovered (immune or partially after infection), or dead (having fully succumbed to the disease).[108] This distinction is very helpful in

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[106] *"The epidemiological view should shift our sense of subjectivity away from private individuation and toward public transmissibility. Emphasis shifts from personal experience and toward responsibilities couched in the underlying biological and chemical realities that bind us. The dynamic between the individual and society broadens and connects with the enmeshed whole through which each of us lives. Each organism is a transmission medium for information—from ideas to viruses—and is defined by who and what each is connected to and disconnected from. The political premise of "immunization"—to make oneself immune by excluding someone or someone else—must be couched in conceptual and technical models of the social that are as inclusive and agnostic as epidemiological models and which carry the same weight of shared responsibility. This means a likely change in how we see relationships between individuals and the whole of society, and in self-identification and symbolic interaction. For some this is an affront to identity and for others its precondition."*
Benjamin Bratton, *The Revenge of the Real: Politics for a Post-Pandemic World* (London New York: Verso, 2021).

[107] This is a development of his idea from *The Stack: On Software and Sovereignty.The Revenge of the Real: Politics for a Post-Pandemic World* uses the framework of the Stack to introduce the idea of positive biopolitics.

Benjamin H. Bratton, *The Stack: On Software and Sovereignty*, 1st edition (Cambridge, Massachusetts: The MIT Press, 2016).

[108] Samuel Mwalili et al., "SEIR Model for COVID-19 Dynamics Incorporating the Environment and Social Distancing," *BMC Research Notes* 13 (July 23, 2020): 352, https://doi.org/10.1186/s13104-020-05192-1.

terms of disease spread mapping but it fails to address the dynamics of, for example, political or cultural influence, where an individual or a group could simultaneously hold multiple contradictory beliefs. Those beliefs are neither potentials awaiting actualisations nor should they be seen as a set (a collection of intellectual objects). Rather they belong to various logics. In that sense, one can know that the fear of hatred of something (or someone) has no rational grounding and yet feel a strong sense of repulsion. Or the causal analysis of the individual situation might not translate to the statistical pattern of a broader phenomenon. Moreover, individual ontology should not be confused with collective behaviour that, as a large system, works according to different laws because large systems do not work like collections of individual agents.[109] Fascism, racism and other forms of othering should not be compared to viral diseases even if the dynamic of their spreading shows certain features of epidemiological outbreak because they rarely take a shape of full ontological "possession". In other words, the epidemiological approach to politics treats matter capable of sustaining simultaneous ontologies as if it were merely biological material. This is not to advocate for any form of metaphysics or claim that there is anything in the universe that is not material. Rather, it is introducing the distinction between the materiality of logics and physicality of material.

Another politically troubling consequence of contagious metaphors is the issue of finding a solution. Once a group is labelled as "infected," following the logic of infectious disease management, the prescribed response is to isolate them from the "healthy" population. This approach runs counter to principles of reeducation, forgiveness, and reconciliation, which emphasise reintegration rather than exclusion.[110]

However, certain features of epidemiological spreading models are useful for understanding how ideas and behaviours propagate through large, complex systems. Con-

[109] This is discussed in depth in Chapter 1.

[110] This argument may seem to take an overly literal view of the epidemiological model. However, the isolationist logic inherent in this model has been mirrored in the rise of far-right rhetoric promoting anti-social notions of self-improvement. These discourses, rooted in the ideology of social Darwinism, advocate abandoning those perceived as weaker or less fit, framing such rejection as essential for personal growth and societal advancement. Noted by: Piotr Radkiewicz and Krystyna Skarżyńska, "Who Are the 'Social Darwinists'? On Dispositional Determinants of Perceiving the Social World as Competitive Jungle," *PLoS ONE* 16, no. 8 (August 11, 2021): e0254434, https://doi.org/10.1371/journal.pone.0254434.

cepts like cascading behaviour demonstrate that once a critical mass of adopters is reached, the spread accelerates, akin to viral outbreaks. Reproduction number (R_0) helps measure how many individuals an idea or behaviour can influence, with values over one indicating likely proliferation. Complex contagion theory, which suggests multiple exposures are often necessary for adoption, is particularly relevant for understanding repeated interactions in consumer or political behaviour. Peeking methods further predict whether an idea or behaviour will continue to spread or fade.[111]

Those models and tools often work but they do not, in fact, serve as proof that fads and ideas *are* like contagions. Rather, they demonstrate that societies and digital infrastructures function and can be considered to be complex dynamic systems.[112] Therefore, change, whether radical or incremental, must be analysed through the lens of what is known about the behaviour of complex adaptive systems, not a collection of individuals or even as a multivariable network. Thus, it is crucial to move beyond simplistic metaphors of viral contagion, instead focusing on the complex, systemic dynamics that shape large-scale dynamics.

ii. Far from equilibrium: phase space and non-local behaviour

Systems far from equilibrium are often described as existing "at the edge of chaos" which means that these systems are close to criticality. In statistical physics, criticality or a critical point (on a phase diagram, for example) is a state separating an ordered phase from a disordered phase.[113] This is a very important point, since if the system was too "ordered" it would be very difficult for its (for example, avian) agents to break down their rigid choreography quickly enough to react to the fast-changing conditions. If the system was too "disordered", the change in insufficiently correlated agents would be too slow and would fail to utilise the collective matter (and force) of the group efficiently. However, at a critical point, thanks to long-range correlations, the swarms can react quickly, efficiently and in the emergent collective interest. For example, by avoiding the danger of a predator through a confusing waving of the collect-

[111] Adam Kucharski, *The Rules of Contagion: Why Things Spread - and Why They Stop* (Wellcome Collection, 2020).

[112] They work similarly to how solutions invented to treat "miasma" work. Although treating stagnant water helped, it didn't help because miasma was a true source of germs.

[113] Andrea Roli, Marco Villani, Alessandro Filisetti, and Roberto Serra, "Dynamical Criticality: Overview and Open Questions," *arXiv* (preprint, December 16, 2015). (arxiv.org)

ive body, or by reacting to the increased noise of stormy weather with tighter distances between the agents.[114] It implies that systemic coherence is a result of fluctuation, oscillatory rhythms and exploratory patterning that do not count as "glitches" in the pattern of order. Instead, patterns of order, such as forms of periodicity, often emerge only over long periods, revealing the system's potential for self-organisation over time. Crucially, not every functional fluctuation in a dynamic complex system can be acknowledged as a phase change.[115]

At the same time, a *radical* change in a complex system does not need to be applied only to something as fundamental as the global paradigm shift related to the proliferation of AI technologies. In planetary infrastructures that consist of systems that are always already interdependent and connected, the radical change can sometimes only affect a single systemic region and yet be driven by non-local principles.[116] Propagation of that change throughout the global networks depends on many factors that will be developed in this section.

To apply the logic of complexity to synthetic systems and infrastructures as more than a mere metaphor it is crucial to grasp the notions of a phase, phase space and a phase transition. A phase refers to a particular configuration of systemic properties: a distinct state of matter, such as liquid, solid or gas in physical systems, or dynamic patterns in complex systems.[117] Ilya Prigogine's work on dissipative systems expands the notion of a phase from its traditional narrow application in systems close to equilibrium to the

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[114] Roland Buffanais, *Design and Control of Swarm Dynamics*, 1st ed. 2016 edition (Springer, 2015).

[115] Ilya Prigogine and Grégoire Nicolis, Self-Organization in Nonequilibrium Systems: From Dissipative Structures to Order through Fluctuations (New York: Wiley, 1977), 25–27.

[116] Sergey V. Buldyrev, Roni Parshani, Gerald Paul, H. Eugene Stanley, and Shlomo Havlin, "Catastrophic Cascade of Failures in Interdependent Networks," *Nature* 464 (2010): 1025–28. https://doi.org/10.1038/nature08932

[117] Melanie Mitchell, *Complexity: A Guided Tour* (Oxford: Oxford University Press, 2009), 293–295.

behaviour and patterning in much larger aggregations.[118] In the systems close to the equilibrium phase transition takes an abrupt form that can be accurately mathematically predicted. Far from equilibrium, the definition of phase ordering needs to incorporate more properties, in those systems a phase implies a form of dynamic rather than thermodynamic stability. In those systems, the phase transition is continuous and connected to an irreversible change in the systemic structure.[119]

The phase *space* could be understood as a conceptual mathematical model, a multidimensional space that marks all possible states of a dynamic system by mapping its defining variables. It could be seen as a multi-parameter image of systemic behaviour. The system's behaviour can be visualised as a trajectory within this space, illustrating transitions over time. In the phase space of the systems close to equilibrium, trajectories are confined to well-defined attractors illustrating the system's tendency of return to its previous energetic configuration. In the systems far from equilibrium, the phase space becomes more complicated with strange attractors and chaotic trajectories that reflect bifurcations, multi-stability, and evolution of attractors. Attractors may take the form of simple fixed points, periodic limit cycles, or more intricate strange attractors, characterised by chaotic behaviour.[120]

In AI systems, particularly within multimodal environments, the introduction of new data types (such as combining visual inputs with language) can be grasped as the system moving into new regions of phase space. This shift may trigger bifurcations, critical transitions where the system's behaviour changes markedly, reflecting the emergence of new patterns of information processing. These bifurcations correspond to

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[118] In textbook differentiation, dynamic systems are usually characterised as either *conservative* or *dissipative*. In conservative systems, the total energy is preserved and their processes are considered reversible. Systems close to equilibrium minimise their free energy and return to equilibrium after perturbations (thermodynamic stability). In contrast, dissipative systems operate far from thermodynamic equilibrium and exchange energy and matter with the environment. They are considered dynamically stable, requiring continuous energy input to maintain their structures. These systems are associated with irreversible processes. In the context of thermodynamics and complexity science, murmurations and societies are dissipative non-equilibrium systems.

Ilya Prigogine, *Introduction to Thermodynamics of Irreversible Processes*, 3rd ed. (New York: Interscience Publishers, 1967).

[119] Ibid.

[120] Hermann Haken, *Synergetics: An Introduction. Nonequilibrium Phase Transitions and Self-Organization in Physics, Chemistry, and Biology* (Berlin: Springer-Verlag, 1983), 164-169.

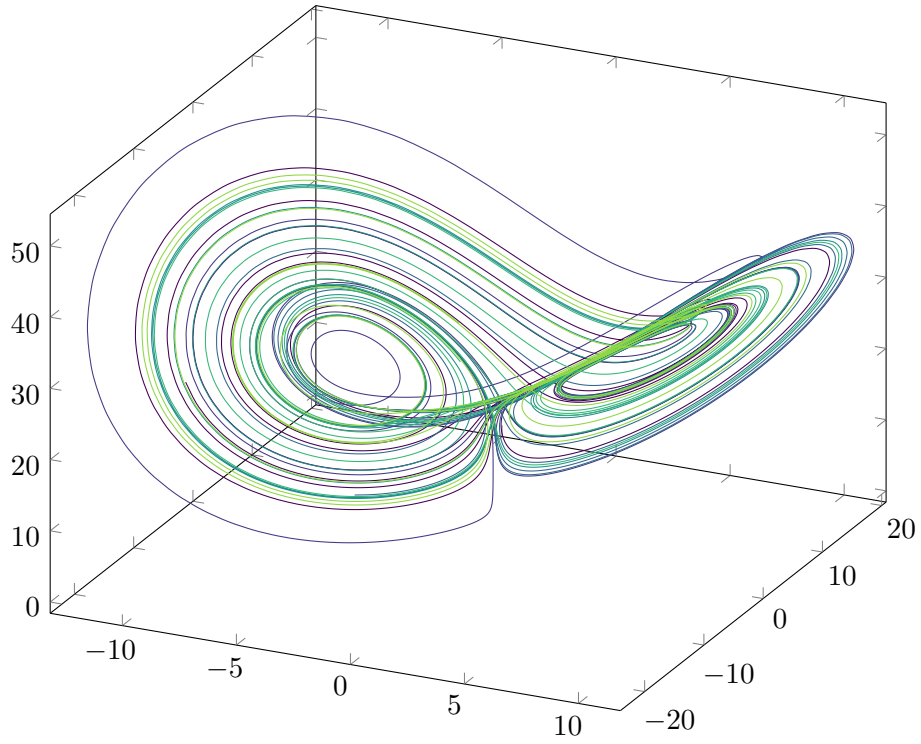


FIGURE 3.3: Lorentz's strange attractor.

The plotted attractor function is $f(x, y, z) = \sigma(y - x), -xz + \rho x - y, xy - \beta z$ with parameters $\sigma = 3.0, \rho = 26.5, \beta = 1.0$, for 6 random origins $-0.25 \leq x_0, y_0, z_0 \leq 0.25$.

moments of nonlinearity, where the system adjusts its internal configurations to integrate the various data types. As the system adapts to these new modalities, its phase space becomes increasingly complex. The model might exhibit "multi-stability", where it can occupy multiple stable states, each dependent on the input modality or the relationships learned across modalities. These stable states represent different configurations of the system's ability to process and synthesise diverse types of information, allowing for greater flexibility and adaptability in its outputs.[121]

In Chapter 2, the mood-mode of the system was proposed as the emergent orientation of matter, its distributed "turn" arising within the system's internal dynamics. The systemic mood-mode drives the systemic reorientation, allowing the system to navigate between states of stability. This capacity ensures that the system remains coherent while moving across its multiple operational modes. Here, the phase space is not an a

[121] This is based on the adaption of the multi-stability theory based on the experimentation with Polymorph described in detail in the further part of this section. F. Freyer, J. A. Roberts, P. Ritter, and M. Breakspear, "A Canonical Model of Multistability and Scale-Invariance in Biological Systems," *PLOS Computational Biology* 8, no. 8 (2012): e1002634.

priori formation — as emphasised in Chapter 2. Attractors are created through the system's movement rather than prescribing it.

In the context of AI multi-modal systems, such as those using transformers or large language models (LLMs), phase space can be seen as a framework mapping all possible states that the system can occupy across different modalities (e.g. vision, language, and sound). This is different to the systemic architecture. These systems, operating far from equilibrium, process diverse inputs dynamically, with their internal states evolving in response to multiple streams of data.

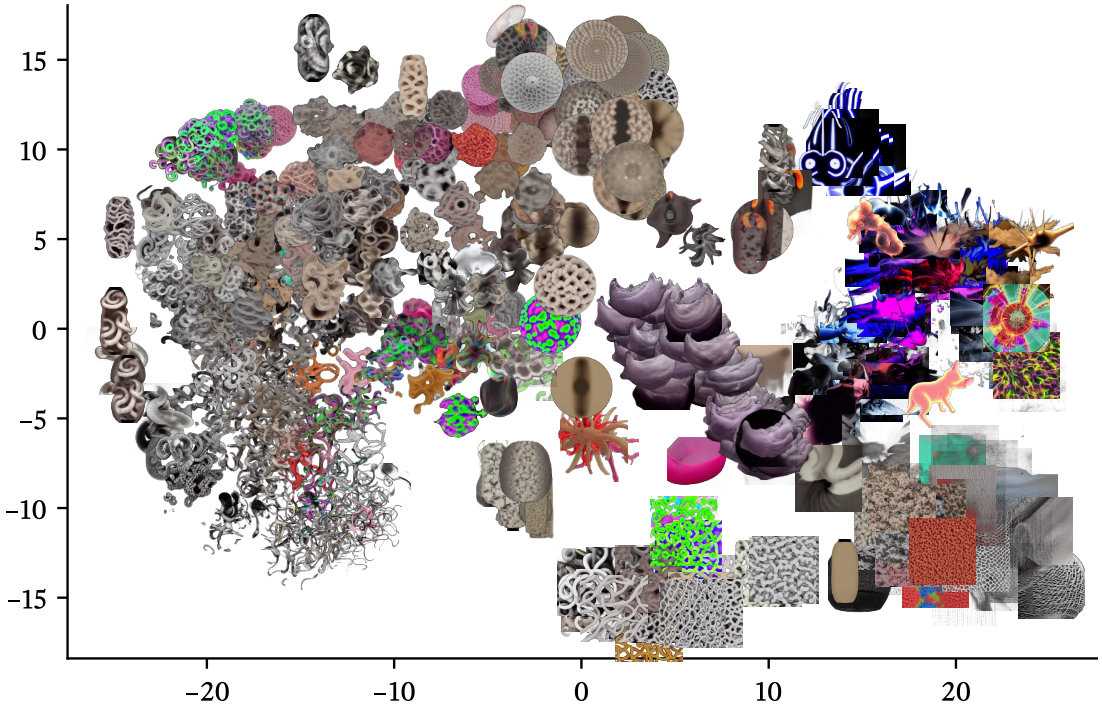
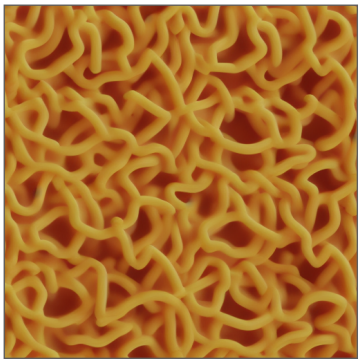


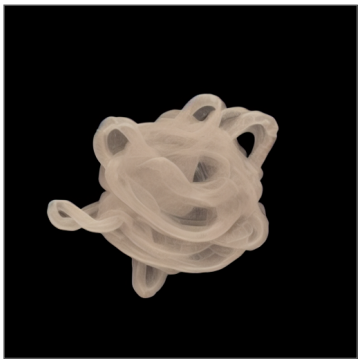
FIGURE 3.4A: Plot of t-SNE mapping of POLYMORPH outputs. To illustrate the various phases of POLYMORPH, the outputs from different stages of its activity were classified using a 152–layered ResNet model and mapped with the t-SNE algorithm to reduce dimensionality. The grouping of outputs expresses various functional shifts, while maintaining cross-generational similarity.

The ResNet classification was performed using a pre-trained model from PyTorch. Each generated image has been transformed to produce an output embedding of size 1'000, each element corresponding to a distinct semantic category from ImageNet (for example "magpie", "coffee mug", or "screwdriver").

The t-SNE algorithm reduces the >1'000 dimensional data to a 2-dimensional plane while reflecting similarities between elements. The formation of clusters results from shared features in the input data.



ID	CATEGORY	ACT.
107	jellyfish	14.955
680	nipple	11.938
111	nematode	11.382
470	candle	11.142
644	matchstick	10.529
459	brassiere	9.852



ID	CATEGORY	ACT.
991	coral fungus	12.414
108	sea anemone	9.722
490	chain mail	9.521
932	pretzel	9.258
945	bell pepper	9.220
109	brain coral	8.654

ID	CATEGORY	ACT.
112	conch	9.522
728	plastic bag	8.399
459	brassiere	8.294
470	candle	7.522
110	flatworm	7.045
971	bubble	6.825

FIGURE 3.4B: Top categories for a few POLYMORPH II generations based on ResNet output embedding ReLU function activations (act.).

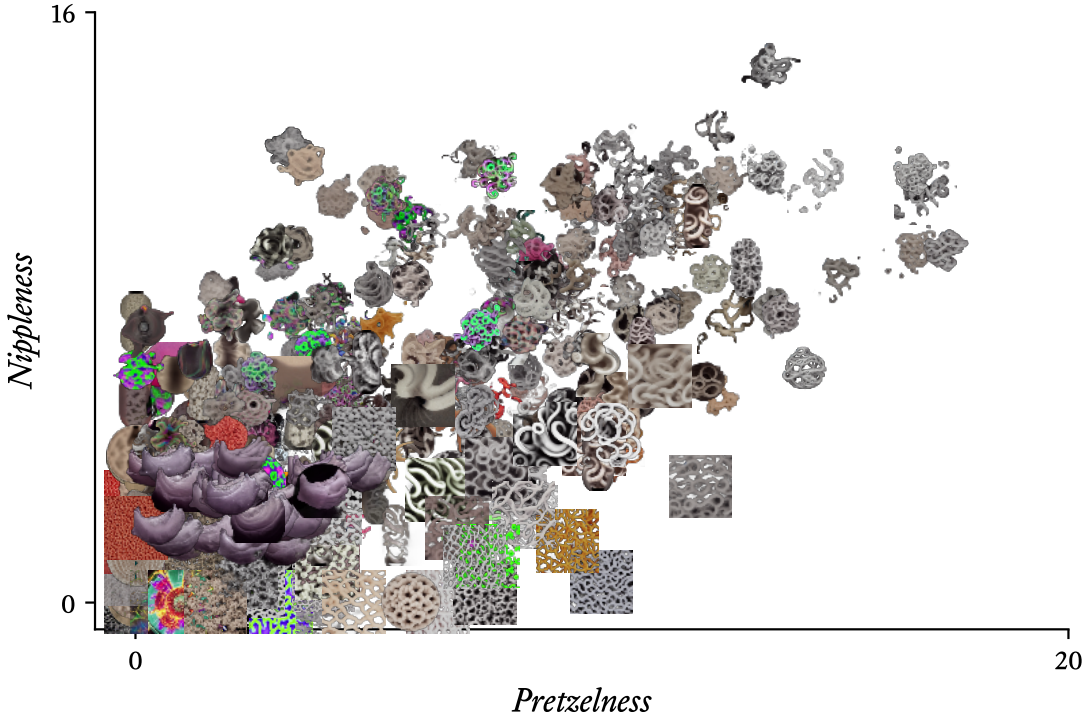


FIGURE 3.4C: Plot of image data across two arbitrary semantic dimensions.

Polymorph's continuous training outputs are not unambiguously separable, producing images that produce strong activations across disparate dimensions, here for classes "nipple" and "pretzel".

Polymorph ii, 2024

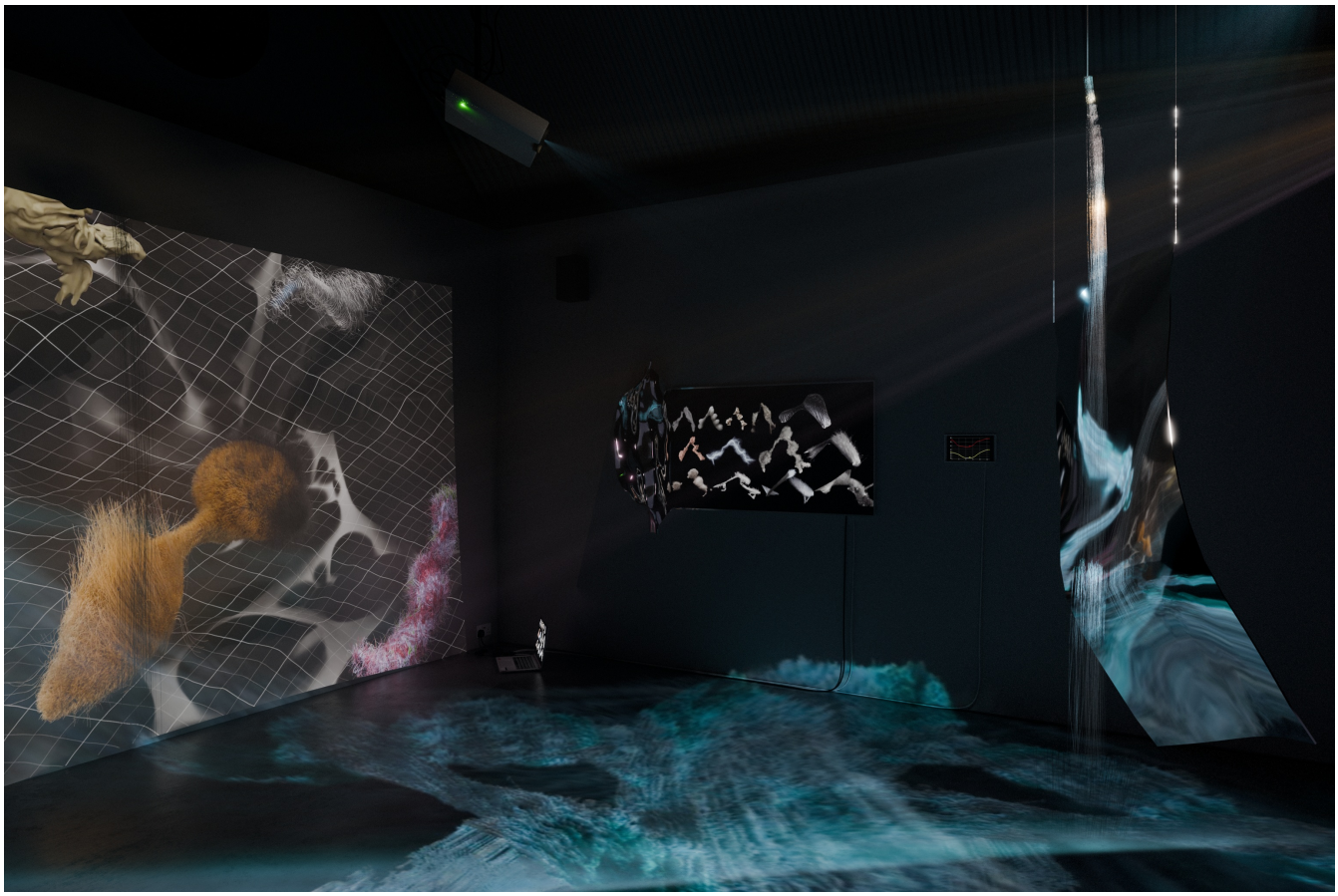


Figure 3.5a: The exhibition view of Polymorph ii.

In this iteration, Polymorph integrates a fine-tuned Stable Diffusion model, two steel plates that operate simultaneously as sensors and sound resonators, and delicate strands of conductive fibers that respond to subtle shifts in room air currents. As data traverses various formats and material forms, the dataset producing the work's visual and auditory aspects expands, entwining itself with the surrounding environment.

Subtle changes in air currents, body movements, and shifts in electromagnetic interference interlink with fine-tuned generative AI models. Together, the sensing, auditory, and optical elements function as both inputs and outputs, generating a dynamic manifold of feedback loops that continuously reshape the structure of the work.

The work can be seen at: https://youtu.be/a3JmDlwtCWU.

Within this phase space, the system's behaviour is shaped by its interactions across modalities. More complex interactions, especially when a mediatory space, such as CLIP discussed in Chapter 2 is not involved, can lead to unpredictable shifts, reflect-

POLYMORPH II, 2024

FIGURE 3.5B: Exhibition detail shots for POLYMORPH II.

ing the system's sensitivity to small changes in input. This is where sudden palpable shifts occur.

The shifts in complex systems are not governed by fixed, predictable thresholds. Instead, they are self-assembled, as discussed in Assembly Theory, but more dynamic and multivariate. These transitions result from the interaction of multiple variables, driven by feedback mechanisms and structural dependencies of the entire system emerging through movement. In that sense, fluctuations and oscillations characterise both systemic dynamics and these thresholds, which do not act as fixed tipping points. Rather, they emerge from the complex interplay of multiple factors, influencing phase transitions in non-linear ways.

The intricate image presented above is a result of experimentation with the already introduced POLYMORPH II, where a similar dynamic was observed during continuous training.[122] The system was exposed to real-time inputs from various sensors and

[122] Sonia Bernac, Jeremy Keenan, Maggie Roberts, PI: Johnny Golding, *Polymorph II*, 2023, multimedia AI system and art installation, 2023, AiDLab.

cameras as well as shifting according to its evolved dynamics. It not only led to transitions in its behaviour and emergent rhythms but conditioned the distinct aesthetics of the cycles of its outputs. POLYMORPH II, during its continuous training, would exhibit distinct "styles" characteristic of each epoch. These styles were not a result of premeditated design or deliberate architectural changes but evolved through self-assemblage as a consequence of the shifting dynamics of the evolving model. The system entered new regions of its phase space as it adapted to changing data inputs, undergoing transitions that reflected the nonlinearity described earlier.

The continuous training process in POLYMORPH II was not based on traditional fixed-cycle training methods. The model evolved dynamically: various data sources were integrated into the system, and real-time inputs continuously retrained the model based on its own outputs. This real-time feedback loop caused the system's behaviour to shift in response to small changes in input, similar to the sudden shifts seen in complex multimodal active matter systems.[123] These observable transitions in POLYMORPH II and the emergence of new aesthetic configurations revealed the capacity of the model to reorganise its internal structure in response to continuous data input.

The analysis of the POLYMORPH'S behaviour showed that with the sufficiently complex environment, the system can experience phase shifts even through recursion, contradictory to the initial assumptions. In this case, however, dynamic and structural complexity were needed for them to manifest as more than changes of rhythm. However, it was continuous training that enabled more noticeable re-configuration — evolution of the model shifted the logic of systemic connections and radically transformed the outputs produced by the system.

Additionally, one the translational elements of the Polymorphs started acting as a register of that phase space — POLYMORPH'S depth maps (Fig. 3.6). Initially designed as a live visualisation of a model's processes, they turned out to act as live diagrams of a phase space. Each stroke of the dynamic mapping corresponds to a systemic signal shift and sensor data translation. In consequence, each map becomes the textual data flow register. The changing behaviour imprinted in those moving textures signalled a shift to a different phase of operation.

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[123] Active matter systems consist of units that consume energy and generate force, driving emergent dynamic properties on larger scales. Moumita Das, Christoph F. Schmidt, and Michael Murrell (2020), "Introduction to Active Matter", *Soft Matter* 16, no. 31: 7185–90.

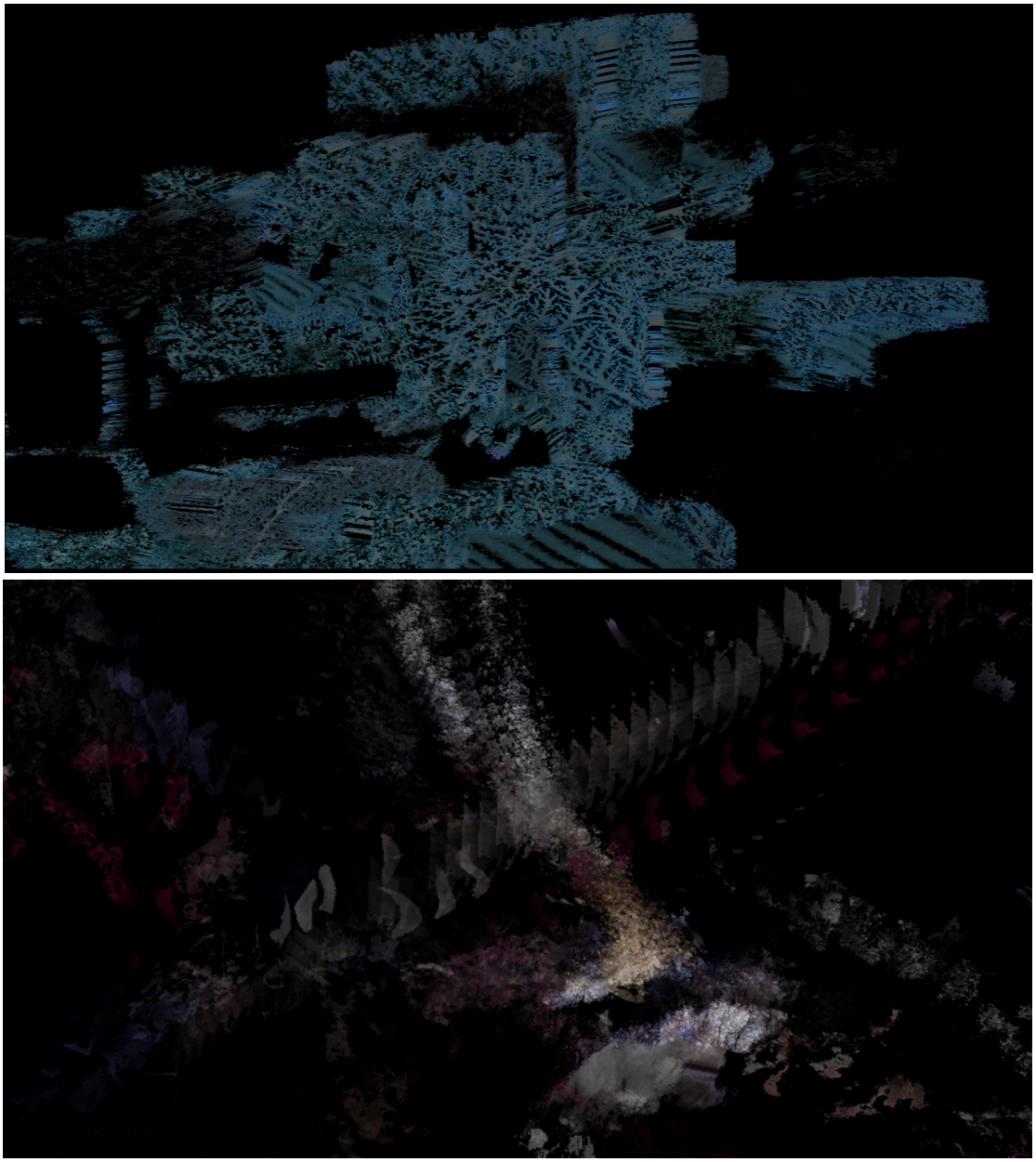

FIGURE 3.6: POLYMORPH's depth maps expressing different emergent systemic rhythms.

Phase transitions in complex systems can be understood as *topological* transformations that reorganise the system's internal connections, dependencies, and dynamics, while still preserving systemic coherence. That "coherence" is not understood here mathematically as preservation of symmetries or genealogically — as derivation of identity through origin. Rather, coherence, as discussed with timbre, means embracing a form of material plasticity that assumes that fundamental re-formation without annihilation is possible. Sometimes, the only past systemic feature *preserved* through a phase change is a form of aliveness.

The mechanisms of topological phase change are more easily graspable in observable complex systems such as bird murmurations. In those systems, alternating non-metric connections between agents drive dynamic interactions. The connections between agents are not based solely on proximity but are shaped by spatio-temporal connections and other factors like speed, direction, stress of the aggregation and other local affiliations.[124] Topological transformations in complex dynamical systems are shaped by multiple feedback loops and dependencies, where "topological" refers to:

1) the system's maintaining coherence under continuous deformation (the system "returns" to itself through movement); **2)** the system's large-scale and cross-scale order being not just the result of local interactions, but emerging from the dynamic and evolving structure of the system itself; **3)** a topological structure that encompasses all systemic elements and dependencies, folding and shifting as the system moves. This highlights that complex clustering cannot be understood through the local dynamics alone — long-range order and self-organisation are essential for shaping emergent behaviour such as radical systemic change.[125]

A topological phase change in synthetic systems can take the form of reorganisation of a latent space that leads to the altered mode of behaviour. For example, "catastrophic forgetting" refers to a phenomenon in neural networks where learning a new task leads to the loss of previously acquired knowledge.[126] In topological terms, this can be

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[124] A singular agent makes on average six to eight connections (with its seven nearest neighbours). Those connections are adaptive and dynamic, implying constant shifts, changes and fluctuations. The links between group members are not metric but topological, which means that the selection of "neighbours" is not dictated solely by the distance (radius) between the agents but through the spatio-temporal convenience and arbitrary rules of attraction. That non-metrical convenience is conditioned by the agent's position in the overarching geometry and folding of the topological transformation of the murmuration. Neighbours are also selected based on similarities in speed, size and direction, as well as scientifically arbitrary parameters, such as stress, trauma or long-term affiliations. The overarching topology of the formation defines its current features that are not a direct summation or a consequence of the local interactions.

The difference between metric and topological connections are described well in: Roland Bouffanais, *Design and Control of Swarm Dynamics*, 1st ed. 2016 edition (Springer, 2015).

[125] Ibid.

[126] Everton L. Aleixo et al., "Catastrophic Forgetting in Deep Learning: A Comprehensive Taxonomy" (arXiv, December 16, 2023), https://doi.org/10.48550/arXiv.2312.10549.

viewed as a collapse of stable attractors within the system's phase space. As the model adjusts to new data, the internal structure undergoes a topological reconfiguration, effectively replacing-forgetting or disrupting the regions of phase space that encoded prior tasks.

For instance, a large language model (LLM) might initially be trained on factually correct data and handle misinformation effectively. However, if the model is later fine-tuned with new data that contains biassed information, catastrophic forgetting can occur, leading the model to overwrite the factual knowledge it previously held. This loss of grounding makes the model more prone to generating hallucinations.[127] As the model's internal structure reorganises in response to new data, stable attractors that once ensured accuracy may collapse, increasing the likelihood of the model propagating fake news. This shows how the internal topological reconfiguration of the model's phase space directly influences its ability to maintain factual integrity, particularly when exposed to biassed inputs.

In generative adversarial networks (GANs), escaping mode collapse represents a positive internal phase change. Initially, the model may produce repetitive outputs, a state known as mode collapse, limiting its ability to fully explore its phase space. However, through internal feedback between the generator and discriminator, the system can suddenly reconfigure itself, shifting to generate a wider variety of coherent outputs.[128] This change is topological because it involves a reorganisation of the system's latent space — where the relationships between inputs and outputs are no longer constrained but instead stretch and evolve. The latent space, which represents the system's phase space, expands as the model discovers new modes, enabling it to navigate and explore a broader set of patterns. This shift happens within the system's structure, reshaping its internal connections and behaviours without requiring external intervention.

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[127] Cf. This paper presents a reversal of this phase change — a model eradicating its bias through fine tuning. Yun Luo et al., "An Empirical Study of Catastrophic Forgetting in Large Language Models During Continual Fine-tuning," *arXiv preprint* arXiv:2308.08747 (2023), https://ar5iv.labs.arxiv.org/html/2308.08747.

[128] Shivani Tomar and Ankit Gupta, "A Review on Mode Collapse Reducing GANs with GAN's Algorithm and Theory," in *GANs for Data Augmentation in Healthcare*, ed. Arun Solanki and Mohd Naved (Cham: Springer International Publishing, 2023), 21–40, https://doi.org/10.1007/978-3-031-43205-7_2.

The significance of topological phase transitions and systemic refolding lies beyond simple kinetics. Matter reconfigures itself through one or many of the inexhaustible material logics that emerge *through* it. In that sense, the chapter proposes that topological phase change is a spatio-temporal transformation, a leap of logic that *produces* new forms of space and time.

To some extent it echoes Thomas Nail's reading of Lucretius and his notion of *clinamen* — the swerve.

> "because it is only their [corpora] swerving motion that produces time and space in the first place. Pedetic motion extends infinitely in all directions and through all time."[129]

In his kinetic materialism, Nail proposes a term kinotopology which, through polemics with monism, introduces an important clarification: *corpora*—the flows of matter—have no sensation. It is the process of curving and folding of matter that leads to emergence of sensing.

> "[Corpora] They are the conditions that produce sensation through the kinotopology of their folds. In other words, the conditions of sensation are themselves nothing sensible."[130]

Nail means by that that primacy of motion is not tantamount to some undifferentiated flux of agential matter that produces movement. In Nail's framework the flows of matter are *conditions* for emergence of logic and sensation. This chapter argued that the topological phase change is *how* a pattern patterns itself as a material emergent phenomenon establishing dynamic structure in contrast to the perpetual pedetic motion of matter.

iii. Complexity at scale: topological frustration and multi-stability

AIs are often viewed through the lens of their more rigid algorithmic predecessors, which limits their perceived capacity for autopoietic and allopoietic transformation. This chapter discussed how AI systems are capable of self-generation and systemic phase change. Chapter 1 explored the generative possibilities of productive intersystemic misalignment. This section argues that AIs, particularly at scale, hold unpreced-

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[129] Thomas Nail, *Lucretius I: An Ontology of Motion* (Edinburgh: Edinburgh University Press, 2018), 204.

[130] Nail, *Lucretius I: An Ontology of Motion*, 132.

ented potential for intersystemic topological transformation, a process fundamentally opposed to the homogenising tendencies found in fascistic logics.

At the heart of topological phase change in complex systems is distributed tension—a dynamic emerging from the system's processes and its expanding entanglement with the environment. In AI, tensions between different forms of sensory data and models can lead to unpredictable systemic behaviour and outcomes, potentially causing collapse or, on the contrary, enhancing functionality. However, at scale, as multiple models, systems, and data types interact, this plurality and the incommensurability of these domains create ontological "frustration". As will be developed below, *frustration* is used here in the sense articulated by Giorgio Parisi: not simply as blockage or contradiction, but as the persistence of competing configurations that cannot be simultaneously resolved within the system. This section argues that such frustration should remain unresolved, as it is precisely what drives systemic transformation.

The drive towards developing foundation models – systems capable of handling multiple modes of input and output – reflects a broader aim to offer a unifying framework for different forms of analytical and generative AIs.[131] This approach prioritises convergence of coding languages across different modalities at the expense of the exploratory translation phase, leading to more predictable AI outcomes. This section argues that, as a tendency, it resembles siloing of the web space that could be observed with the evolution of the Internet, where the rich and exploratory early phase of online interactions got homogenised into more structured, closed ecosystems dominated by a few major platforms.[132]

While alignment might seem the simplest approach to ensuring coherence and productive inter-agent knowledge transfer, it is neither essential nor always desirable for collaboration. The analysis of active matter complex systems in the previous section revealed that full synchronisation is not desirable in dynamic environments.[133] Selective functional signalling proves to be a more efficient strategy than full informational transparency. Interactions within and between systems, whether biological, technolo-

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[131] Rishi Bommasani et al., "On the Opportunities and Risks of Foundation Models" (preprint, arXiv, August 2021).

[132] Shoshana Zuboff, *The Age of Surveillance Capitalism: The Fight for a Human Future at the New Frontier of Power*. (New York: PublicAffairs, 2019), 66–67.

[133] Yiwei Zhang and Étienne Fodor, "Pulsating Active Matter," *Physical Review Letters* 131, no. 23 (2023): 238302, https://doi.org/10.1103/PhysRevLett.131.238302.

gical, or social, often flourish through the tensions and conflicts that arise from diverging perspectives. Robustness, adaptability, and flexibility in complex systems frequently depend on delayed alignment, the presence of noise, and varied interpretations of the system's functioning or goals.[134]

Giorgio Parisi's work on spin glasses investigates how frustration drives topological phase changes in complex systems.[135] In spin glasses, local interactions create frustration that prevents stable states, forcing the system to navigate broader configurations, often leading to multiple stable outcomes. Parisi describes a situation when a complex system, like a spin glass evolves into multiple stable states that coexist, allowing the system to explore new configurations, as a response to internal "tensions".[136] This fragmentation opens up richer dynamics, where the system holds multiple realities at once, adapting to frustration rather than being stuck in a single stable state.

In *The Flight of Starlings*, Parisi, applying his observations to large complex systems, shows how frustration drives topological shifts in murmurations of birds, preventing systems from getting stuck in local minima. These shifts constantly reconfigure the system's phase space, altering internal structures while maintaining systemic coherence.[137]

The reason for taking from Parisi's frustration than, for example, agonism is that frustration not only offers a mechanism for sustaining multistability but also speaks to the continuous refolding and movement within a system, where tensions persist and reshape the landscape without leading to resolution. This structural complexity allows systems to evolve dynamically within stable yet conflicting states. In contrast, agonism frames conflict as a value and a sign of systemic health without making it into a structural proposition.[138]

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[134] Roland Bouffanais, *Design and Control of Swarm Dynamics*, 1st ed. 2016 edition (Springer, 2015).

[135] A spin glass is a type of disordered material in which the magnetic moments (or "spins") of the atoms are randomly aligned, causing frustration in their interactions. Giorgio Parisi, *In the Flight of Starlings: The Wonder of Complex Systems* (London: Allen Lane, 2016).

[136] Ibid.

[137] Ibid.

[138] Chantal Mouffe, *Deliberative Democracy or Agonistic Pluralism*. (Vienna: Institut für Höhere Studien, 2000), 34.

The relevance of Parisi's work to AI systems lies in offering an image of how tensions between incommensurable models, data types and types of cognition, assuming that humans are an inherent part of those systems, could generate similar conditions of frustration in the emerging ecosystem of AI technologies. Parisi's systemic multistability offers an image of the cognitive ecosystem that does not require a totalising foundational model bridging different forms of intelligence.

However, as mentioned in the previous sections, complexity and difference are not a necessary guarantee of emergence and the realisation of the transformative potential of cognitive frustration is not likely to happen on its own. There is a need for techno-political strategies, positions and images of thought that would resist defining another paradigm shift by a few dominant technological narratives.

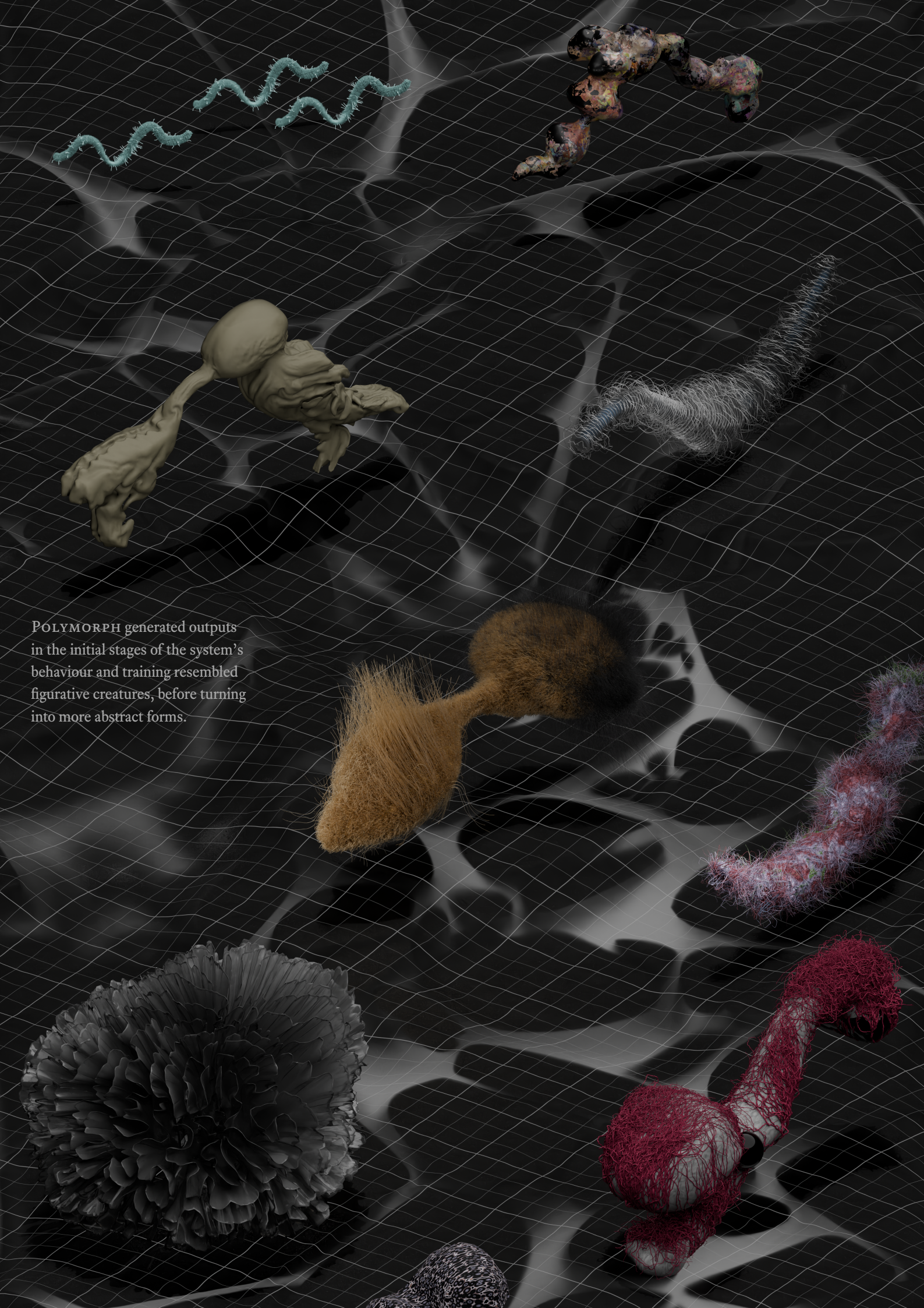
AI is not a ready-made technology to be adopted or resisted. The meaning of AI and its weaving into existing cognitive infrastructures could be subject to the forces of the market, strategised violence and manipulation, as well as inertia of mediocrity. The alternative approach is to treat synthetic intelligences as Lem's "existential technologies," exploring their unknown potentials through poietic experiments like POLYMORPHS, where the system's dynamics and generative capacities are vivisected and subjected to material interventions, all within methodologies that avoid rigid assumptions or predetermined outcomes, allowing the system to reveal its capabilities through unbounded exploration.[139]

That strategy explored in POLYMORPHS applied at scale could take the form of identification of moments where miscommunication, misrepresentation and misrecognition between intelligent synthetic agents, bodies of data and pre-digital infrastructures necessitates infrastructural research, experimentation and decisions. Those intersystemic, "frustrated" spaces form the *Uncanny Ridge* — a term coined by the author and collaborators in the Antikythera think tank research team in reference to the Uncanny Valley, a well-known concept from early robotics that describes the eerie discomfort experienced when confronted with machines that appear almost, but not quite, hu-

[139] Bogna Konior, "The Gnostic Machine: Artificial Intelligence in Stanisław Lem's Summa Technologiae," in *Imagining AI: How the World Sees Intelligent Machines*, ed. Stephen Cave and Kanta Dihal (Oxford University Press, 2023), 0, https://doi.org/10.1093/oso/9780192865366.003.0006.

man.[140] The Uncanny Ridge, instead of focusing on horror of cognitive dissonance, maps the regions of "frustrated" potentials, where systemic incommensurability leads to emergence of meaning and offers opportunities for political and poietic intervention.

[140] Sonia Bernac, Tyler Farghly, Gary Zhexi Zhang, "Traversing the Uncanny Ridge: Searching for Novelty in Intersystemic Communication" (Antikythera Think Tank, London, CSM, July 2024)., cf. Masahiro Mori, "The Uncanny Valley," *IEEE Robotics and Automation* 19, no. 2 (2012): 98–100, trans. Karl F. MacDorman and Norri Kageki (New York: Institute of Electrical and Electronics Engineers), https://doi.org/10.1109/MRA.2012.2192811.



POLYMORPH generated outputs in the initial stages of the system's behaviour and training resembled figurative creatures, before turning into more abstract forms.

Conclusion

This research examined distributed synthetic intelligences as complex, multimodal systems far from equilibrium, situating them within the framework of complexity science while critically interrogating materialist and metaphysical philosophies applied to understanding AI. Through philosophical, material praxis, it assembled a philosophical framework for understanding sense-making in distributed synthetic systems, introducing five original philosophical structures-images: *semi-autonomous simulacra, mood, phase slip, systemic frustration*, and *topological phase change*. Framed as a bestiary, this thesis did not aim to taxonomize synthetic ecosystems of AI; rather than engaging in comparative evaluation, it followed the approach of mediaeval books of beasts, focusing on the patterns of meaning, strange circulations and 'wisdoms' that emerge within these systems.

The experimentally developed philosophical constructs presented in this thesis articulate the fabric of reality as neither ontologically divided nor woven from essentially understood parts, layers, or dimensions such as the virtual, social, economic, or cultural. Instead, they focus on cross-systemic attractions, where such distinctions are far less relevant. This assembled imaginarium addressed the epistemological gap opened by the strange ontologies of synthetic distributed systems, whose sense-making mechanisms and the risks associated with accelerated synthetic content generation are often analysed and regulated through outdated methodologies. These methodologies fail to grasp the immediacy of connection-attraction and, as a result, overlook the fact that these new intelligent bodies of synthetic systems are material, emerging through their own learning processes. Although embedded within anthropocentric frameworks — ingesting data infused with human concerns, operating through architectures engineered by human design, and sensing the environment through human-made instruments — AIs are not the collective unconscious, mirrors of human cognition, or mere tools. Instead, they *practice thinking* in ways that can transcend recombinatorial content generation, human-guided creation, data analysis, or conventional forms of assistance.

This thesis carefully examined various accusations and concerns surrounding AI technologies, particularly those that characterise their impact on the political fabric as detrimental: encouraging violations of privacy, accelerating anti-democratic tendencies, replicating and amplifying existing social biases, and contributing to the crisis of authenticity and relativisation of truth. It argued that while AI technologies can indeed become subordinated to pseudo-teleological structures set by systemic pasts, such as biased genealogical precedents, the material logics of contemporary AIs as synthetic systems are not inherently bound to these biases. Instead, they possess the capacity to deviate from and reconfigure the patterns embedded in their training data, suggesting a more dynamic relationship between data and system than is often assumed.

The thesis also addressed a key critique of AI: that, as a broader phenomenon, it contributes to the gradual homogenisation of meaning, whether through the instrumental algorithmisation of life, the creation of radicalisation chambers, or through data inbreeding. This homogenisation is often believed to turn systems fascistic or to be one of the characteristics of fascist systems. The thesis examined both the assumed equivalence between homogenisation and fascistic tendencies, as well as the claim that AI inherently drives this homogenisation. It concluded that: 1) the fascistic paradoxically relies on the heterogeneous, sensuous pleasure of violence for its formation, with violence forming emergent fascistic attraction rather than being a byproduct of uniformity, and 2) AI systems form a diverse ecosystem of incompossible entities, characterised by intersystemic tensions and frustrations that, in their planetary diversity, resist a simple drive towards homogeneity.

The research, through a detailed analysis of the architectural logics of popular AIs, identified the architectural reasons behind the uncanny familiarity, or rather, the 'canniness', of AI-generated content. It revealed that this effect stems not from any essential characteristics of AI but from the prearranged sense-making matrices that shape the models' logic, using ready-made proximities to guide their outputs. As discussed in Chapter 2, and realised through the POLYMORPH experiments, this canny valley aesthetics in AI-generated content is not an inevitability but a consequence of specific design choices and can be reconfigured to be systemically and aesthetically exploratory.

The research examined and formulated the difference between the post-Cambridge Analytica assessments of anti-democratic tactics, rooted in unethical profiling and al-

gorithmic control, and the newer forms of fascistic influence that have emerged in the wake of the recent technological paradigm shift, marked by the proliferation of publicly accessible AIs. This is discussed through the shift from Zuboff's extractivist surveillance capitalism to Sherman's Polyopticon, the distributed matrix of sensing, coding, decoding and (machine) learning. The growing complexity and autonomy of these systems alters the topology of power itself, with data pattern and contingency playing a particular role in these dynamics: novel forms of connection, circulation, agency and violence.

Following from that, through the original reformulation of a *phase slip*, the research explored moments when meaning detaches from its previous structure, resulting in a disruption of coherence within synthetic systems. A phase slip is a break in continuity, a moment when the logic governing a system's operations shifts, allowing for new alignments and configurations to emerge. This shift can manifest as a deviation from the inherited patterns of data, creating space for novel modes of sense-making that are not fully constrained by prior training or embedded biases.

Rather than perpetuating a seamless flow of uniformity, phase slips introduce discontinuities that can fracture the rigid alignments of meaning, potentially subverting intended structures by enabling unexpected transformations in how information, narratives, digital artefacts, or ideas circulate.

Through semi-autonomous simulacra, that could be a data pattern, a digital artefact, a narrative structure, or a slice of discourse, the thesis addressed how operational autonomy can emerge within synthetic systems, untethered from strict genealogical lineage or human-directed intentions. These simulacra, far from passive reflections, actively reshape their environments, generating new patterns and configurations through dynamic interactions with data, other agents, and material conditions. This autonomy is not defined by total independence, permanence or consciousness but by a strange agency to be *a thing* shaping sense-making processes. For any meticulously constructed propaganda or attempts at social manipulation, this entails a risk: meanings may mutate, shift political affiliations, and attach themselves to alternate circulations. In warfare, this could mean that a fragmentary data imprint—whether of an individual, a location, or any number of contextual traces—might become decisive in the targeting process, potentially leading to an attack summoned by this fragmentary digi-

tal double. Conversely, a data pattern collected at the site of suspected injustice might be augmented to form a complete scene of witnessing.

Importantly, those semi-autonomous simulacra are often cohering on a large scale. Following the shift towards complexity theory in the study of large-scale systems, this research rethought change as a cross-systemic phenomenon. The original framework of mood proposed in this thesis offered a way to understand the mechanisms of self-assemblage and transformation within complex adaptive systems as dynamics of a folded surface — a manifold — rather than as mere interactions between discrete agents. This approach appeared to be particularly useful for grasping the body of the Polyopticon not as a collection of systems, organisms, or physical technologies in relational dependencies, but as a constellation of logical attractions that frequently disregard boundaries of skin, the incompossibility of languages and extensions, sensorial limits, or any preexisting commonalities of material, species, or intention.

Therefore, this research rethought mood not as a psychological state belonging to or produced by sentient creatures, re-imagining it as an emergent systemic mode — a tensor field — that encompasses the dynamics of systemic turn-ing. In this thesis, mood is introduced as the ontological 'how' of motion — an emergent tensor field, reflecting the distributed orientedness of matter. This reformulation has profound political consequences: **1)** mood can become the basis for systemic turning that does not require any a priori commonality, such as shared collective identity, wavelength, values, language, or code among agents; **2)** it allows systemic parts (not necessarily entire agents) to align and participate in the same motions without sharing the same telos or ultimate goal; and **3)** the emergence of mood preserves the symmetries of its constitutive agents and systems, functioning not as an annihilating force, but as one that respects the integrity of systemic parts within the emergent property. That framework, operating on tensors, allows for understanding of both political mood swings and emergent bias in generative AI architectures beyond the rhetoric of flawed data, emphasising that those phenomena do not belong to separate domains.

Mood as an emergent mode within complex systems enabled an understanding of change in its intricate dynamics without relying on any a priori collective consensus or external force. The anatomy and dynamics of a radical transformation, understood as a palpable, radical shift in the system's overall state, is proposed in this thesis as a topological phase change.

A topological phase change is a transformation within a complex system that reorganises its internal connections, dependencies, and dynamics, while preserving its overall coherence. Unlike small adjustments or linear changes, a topological phase change reshapes the system's structure in a way that fundamentally alters how it organises itself. This change does not merely modify existing parameters; it creates new operational modes resulting in behavioural patterns or operational capabilities that were previously inaccessible. It allows for escaping the constraints of recursive path dependencies through a logical leap, and enables systemic plasticity. This thesis argues that topological transformation through radical refolding, does more than simply rearrange; it enables the emergence of new spacetime. The tipping point of this radical change is nonlocal and self-assembled, enabled by the cross-systemic cohesions. In that understanding, topological phase change demystifies incompleteness that is no longer reduced to some fundamental unpredictability of a system but rethought as a form of systemic emergent indeterminism that can be compatible with local causality.

Building on that, this thesis argued that intersystemic frustration — the tensions among models, data types, and human–AI cognition — drives systemic transformation and complexity in AI. This stands in opposition to the commonly expressed need to establish a foundational model for the existing AIs. Drawing on Giorgio Parisi's multistability and systemic frustration, it suggests that frustration itself enables richer dynamics within the human-AI cognitive ecosystem. Unlike the static view of agonism, which treats conflict as inherently valuable without considering its transformative potential, ontological frustration provides a dynamic structural basis for sustaining multistability without enforcing planetary-scale consensus. Frustration here is not merely conflict or differentiation as an end in itself; rather, it functions as a topological generative tension that drives systemic transformation.

Through the articulation of those original philosophical images and a thorough analysis of the various bodies of synthetic intelligence, the emerging conclusion of this thesis is that AIs in their planetary proliferation are not inherently causing homogenisation, radicalisation, and acceleration of violence. However, paradoxically, when applied instrumentally or as an extension of averaged cognitive capabilities and logics they become replicators of common-sensical understanding — the oracles of common sense trained on a distributed dogmatic image as it was grasped through the analysis of CLIP. Those dangers should not be trivialised as they go beyond mediocre content generation. For example, in warfare, they become woven into military cognitive infra-

structure that enables suspension of the ethical through the extended distributed simulations.

This research challenged the denialist view that AIs are mere tools, reducible to human design and intention. They are already a strange, distributed phenomenon, demanding urgent experimentation and critical scrutiny, and their alleged impenetrability is largely an epistemic problem to which this thesis offered solutions.

A lesser-known Heideggerian perspective on the logic of techne stresses that it has "nothing to do with anything technological".[1] Rather, it is grasping and being grasped (not in return but at the same time). This understanding of techne aligns closely with Dasein, or being-in-the-world, implying that one cannot extract oneself from the world or adopt a purely objective, universal perspective. Crucially, in the context of AIs, this embrace of grasping should extend beyond a phenomenological move (preserving its immediacy) to enable a defamiliarising feedback loop on a planetary scale. This defamiliarisation does more than shift human perspective on oneself. In Heidegger's work, techne marks the movement of poiēsis (ποίησις); it is a form of (sense) making, a bringing-forth not something that is already there but something new through something that is already there. That is the logic of emergence.[2]

Thinking about synthetic thinking is necessarily groundless, as it must assume the possibility that all a priori assumptions — the dogmatic images of intelligence, creativity, logic, and the conceptual apparatus itself — were erroneous in their foundational premises. The AI revolution and its potential dangers should not be assessed through the lens of humanism, posthumanism, or any framework focused on human self-analysis or self-reflection. Instead, it calls for a philosophy–as–praxis that, with an aware-

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[1] *"Likewise, the essence of technology is by no means anything technological. Thus we shall never experience our relationship to the essence of technology so long as we merely conceive and push forward the technological, put up with it, or evade it. Everywhere we remain unfree and chained to technology, whether we passionately affirm or deny it."*
Heidegger, *The Question Concerning Technology*, 1.

[2] *"This prospect strikes us as strange. Indeed, it should do so, should do so as persistently as possible and with so much urgency that we will finally take seriously the simple question of what the name "technology" means. The word stems from the Greek. Technikon means that which belongs to techne. We must observe two things with respect to the meaning of this word. One is that techne is the name not only for the activities and skills of the craftsman, but also for the arts of the mind and the fine arts. Technë belongs to bringing forth, to poiësis; it is something poietic."*
Heidegger, *The Question Concerning Technology*, 4.

ness of its own entangled position, enables an attunement to: **1)** the epistemic structures embedded within AI models and infrastructures (the AIs' dogmatic images of thought); and **2)** the possible forms of *poietic* praxis emerging within them.

The philosophical-poietic experiments conducted throughout this thesis, including the *Deviations of Fruit Fly*, *Leave Britney Alone*, and, most significantly, the iterative evolutions of POLYMORPH, demonstrate how this much-needed epistemic inquiry could be enacted.

Recognising that art is a form of philosophy, deeply attuned to the questions of matter and materiality, this research seeks its audience among those philosophical practitioners who, through their experiments with logic — whether through writing, coding, sculpting, painting, or constructing — are prepared to explore the possibilities of thinking, cohering, and sense-making within distributed synthetic systems. This exploration implies not only creating the conditions for new material logics to emerge but also developing a form of philosophical experimentation — a form of rigorous curiosity — capable of distinguishing these logics from mere error, recognising an emergent logic that has never been before.

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