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Symbiotic Intelligence: Rethinking AI with Mycelium

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Abstract

Symbiotic Intelligence (SI) rethinks dominant evolutionary narratives within Western artificial intelligence (AI) development through a practice-led research methodology centred on co-creating with mycelium. This research investigates how living mycelium can inform and reframe prevailing AI narratives, particularly those shaped by evolutionary logics. These narratives, found in developer manifestoes and futurological discourse, often frame intelligence within competitive, deterministic paradigms rooted in social Darwinism and invoke eugenicist ideas such as the g-factor in intelligence. Through the creation of responsive art installations, the project positions mycelium as a material and conceptual collaborator, opening new spaces for dialogue. This article inverts the curatorial strategy of incorporating AI technology into artistic practices. Instead, we show how arts-led 'making' practices can generate new narratives that propose alternative ethical frameworks and sustainable directions for technological development. We argue that a direct, generative but non-deterministic relationship exists between AI narratives and the technical actualisation of AI. Specifically, *SI* contends that: (i) evolutionary narratives underpin Western AI imaginaries; (ii) these often reflect reductive social Darwinist models; (iii) counter-narratives grounded in collective assemblage and *symbiotic intelligence* are essential for shaping more complex and sustainable AI futures.

Keywords: art; mycelium; artificial intelligence; more-than-human; post-human; symbiotic intelligence; co-creation

1. Introduction

Life did not take over the globe by combat, but by networking. (Margulis and Sagan 1997)

Symbiotic Intelligence (SI) is an ongoing practice-led artistic research project developed by John Wild and Shira Wachsmann exploring how artistic practice can interrogate and reconfigure dominant narratives surrounding artificial intelligence. The project is situated within the field of artistic research, where knowledge is generated through material practice, encounter, and reflection, rather than through hypothesis-driven or technical optimisation (Sullivan 2005, pp. 173–74, 180). The project originated from questions about AI's relationship to storytelling and narrative ecologies, initially framing these technologies as tools that amplify or intensify existing cultural forms. Through sustained engagement with living mycelium, the interconnected fungal networks that sustain ecosystems, this framing proved inadequate. Working with more-than-human systems revealed intelligence not as a discrete capacity possessed by individual entities, but as an emergent property of ecological relations. Intelligence, we came to understand, operates as a co-creative force that enriches the very fabric of ecological phenomena.

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This realisation repositioned our methodological orientation. Rather than analysing AI's impacts through predetermined theoretical frameworks or treating narratives as explanatory variables, we developed artistic practice as a mode of inquiry grounded in material engagement and situated ecology. We describe this approach as 'critical unknowing': not a speculative stance, but an enactive research position in which understanding emerges through co-creation with more-than-human systems rather than through the application of interpretive schemas.

At the core of this investigation lies a commitment to understanding AI not merely as a technological or computational system, but as a cultural, historical, and ecological phenomenon. AI is approached here as embedded within a human-centric narrative ecology that shapes how intelligence is imagined, valued, and legitimised across technical, institutional, and cultural domains. By collaborating with mycelium and emerging technologies, the project presents an alternative framework for understanding intelligence, one that foregrounds interdependence, adaptation, and distributed agency. This synthesis of organic and machinic systems functions both materially and theoretically, opening a space to investigate intelligence as a relational and ecological process emerging through artistic practice.

Symbiotic Intelligence: Re-Thinking AI with Mycelium is structured as a dialogue between four exhibited installations and the AI discourses that evolved in parallel with, and in response to, their making, their exhibition, and the reflective discourse that emerged from these processes. Rather than proposing a linear or causal relationship between the installations, the narratives and technical systems, the project examines how AI imaginaries operate as environments of possibility that condition what becomes thinkable, fundable, and legitimate within AI development. By working at the intersection of art, biology, and computational systems, *SI* creates conditions for what we describe as collisions and co-creations between different modes of worlding shaped by particular sensory relations and perceptual regimes. It is in these encounters that new possibilities arise, not as predetermined outcomes, but as emergent configurations. Through embodied, material practice, the research reveals the contingency of dominant AI narratives and brings alternative paradigms grounded in symbiotic rather than competitive logic into presence.

2. Methodology: Thinking-Through-Making

Symbiotic Intelligence is a practice-led artistic research project that develops through successive iterations of art installations, with each new work building upon the discoveries and challenges encountered in earlier installations. The research operates within an enactive and performative methodological framework, in which artistic practice constitutes a primary mode of inquiry. This iterative process generates both aesthetic and epistemic outcomes. Aesthetically, the works create affective, spatial experiences that invite audiences to sense and think intelligence differently. Epistemically, they produce insights about material behaviours, technical affordances, and conceptual relations that emerge only through the process of making. The installations operate not as representations of symbiotic intelligence, but as enactments of it: actual instances of multispecies, multi-material collaboration unfolding in real time.

Each installation incorporates living mycelium. The mycelium functions as a live sensor, maintaining continuous correspondence with its environment. Electrical signals within the fungal networks fluctuate in response to changes in environmental conditions, including humidity, temperature, and vibration. While scientific research into fungal electrical signalling remains an open and evolving field, this project does not treat such signals as empirical evidence of cognition or communication. Instead, these signals are understood as expressions of living biological logic and as material events within a relational assemblage,

which are translated into changes in light and sound. These transformations shape audience movement, attention, and affective state. Through these feedback loops, perception and sensing become relational events rather than properties of any single subject. They circulate across assemblages of bodies, materials, and technologies, where each element both senses and is sensed.

Contemporary art practice is at the core of this approach. It does not serve as a translator of scientific or technical processes, nor does it seek to validate scientific claims through artistic means. Rather than illustrating predetermined theoretical positions, each installation emerges from direct engagement with living mycelium and computational systems. These installations generate embodied, aesthetic spatial encounters that challenge dominant AI imaginaries in ways that conventional text-based academic discourse cannot achieve.

The installations function as both research outputs and research methods, serving as complex sites of encounter where theoretical provocations are tested through material operation, where material processes reveal properties that cannot be fully anticipated in advance, and where collective assemblages enable new ways for intelligence, technology, and coexistence to come 'to presence'. Each installation creates an environment in which entities, human, more-than-human, and technical, perform, adapt, and co-develop. Knowledge is produced here performatively and relationally, rather than through abstraction, generalisation, or representational claim-making.

Working with mycelium demands an ethics of care enacted through practice. The mycelium organism requires specific environmental conditions, protection from dehydration and contamination, appropriate temperature ranges, and suitable substrates for growth. These are not merely technical requirements. They are ethical obligations that arise from the conceptual framework of symbiosis. Our research is consequently grounded in an ethics of care, using a practice-led, philosophical, and discursive methodology of thinking-through-making. Within this framework, care is understood not as an external value applied to intelligence, but as a constitutive condition of its emergence.

In parallel with the creation and exhibition of installations, we conduct community workshops that invite participants, particularly those with lived experiences underrepresented in mainstream AI discourse, to reconsider AI through the lens of mycelial symbiosis. These workshops function as sites of collective reflection and encounter rather than as empirical data collection. While they do not form part of the formal research methodology and are not recorded as data, they actively inform the evolution of the artistic practice and the conceptual frameworks that emerge from it, contributing to broader efforts to expand the scope of debate surrounding AI futures.

The research generates multiple forms of documentation: technical records of sensor behaviour, aesthetic documentation of exhibition experiences, and theoretical reflections that trace the dialogue between making and thinking. Analysis occurs through ongoing reflection on the relationships between these different registers of knowledge, explicitly recognising artistic practice as a rigorous and legitimate mode of knowledge production with its own epistemological grounding. This positions the research within the field of artistic research, where art practice is recognised not as a supplement to theory, but as a site where theory is produced, transformed, and contested through material engagement.

Through these recursive processes of making, exhibiting, and collective reflection, SI exposes and reimagines the conceptual beliefs and mythologies circulating within Western AI developer cultures. Rather than claiming direct influence on technical development, the project intervenes at the level of imaginaries by reshaping the narrative, ethical, and perceptual conditions through which intelligence is understood. By juxtaposing artistic, biological, and computational modes of thinking, the project cultivates spaces for critical

and ethical imagination, proposing models of sustainable coexistence between human, more-than-human, machinic, and ecological forms of intelligence.

3. Interference Spores

The first installation created as part of the research was *Interference Spores* (Figure 1). It was exhibited at *season.s.z.n. Gallery* in London in June 2023 as part of *A pAIn in the...*, an exhibition and programme of workshops exploring critical narratives surrounding AI. The installation took the form of an augmented mycelium network, combining living fungal material with technological systems to explore hybrid modes of communication and interaction.

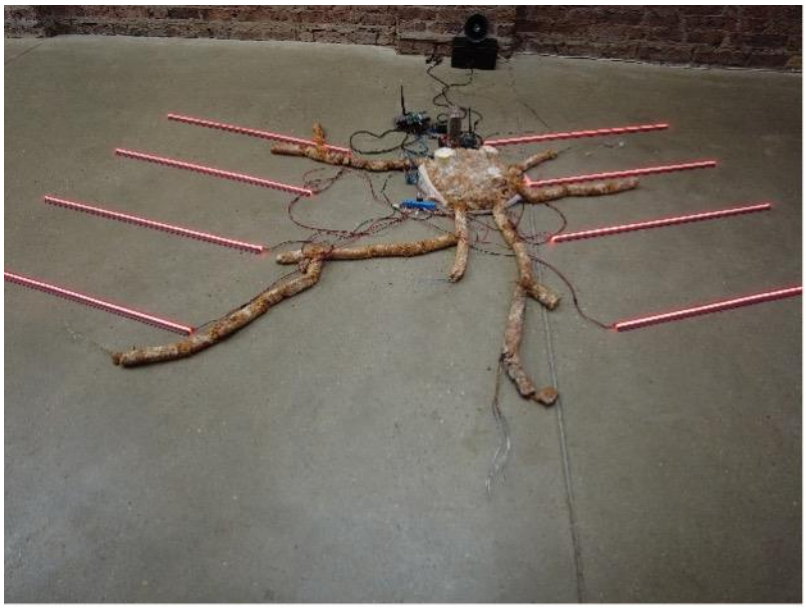

Figure 1. Interference Spores.

Mycelium is a complex, interconnected network formed by countless individual hyphae, fine thread-like filaments that grow and branch to explore and decompose their environment. Together, these hyphae create a living system that enables fungi to exchange nutrients, communicate chemically, and sustain entire ecosystems. Mycelium has evolved through forming strong symbiotic relationships with other species, and, according to Adam Adamatzky, Professor of Unconventional Computing at the University of the West of England, Bristol, "it uses neural-like spikes in electrical activity to share and process information throughout its large, entangled network of hyphae." (Adamatzky 2022) He further explains:

> *"We found evidence of spike trains propagating along the mycelium network. We speculated that fungal electrical activity is a manifestation of the information communicated between distant parts of fungal colonies. We adopted a framework of information encoding into spikes in neural systems and assumed that the information in electrical communication of fungi is encoded into trains of spikes."* (Adamatzky 2022)

Inspired by Adamatzky's research, *Interference Spores* (Figure 1) sought to connect with the Grey Oyster mycelium's intricate patterns of electrical signalling. Using a custom-designed voltage divider, the system aimed to detect electrical amplitudes ranging from 0.03 to 2.1 mV, as identified in Adamatzky's (2022) study. These spikes in electrical activity were visualised through a sculptural array of lights that momentarily dimmed in response to each detected signal within the mycelium. The augmentation of the fungal network with an installation of eight one-metre-long red, neon-like lights enabled viewers to perceive the

Morse code-like sequences of electrical impulses generated and transmitted through the mycelial network.

In addition, *Interference Spores* (Figure 1) incorporated a Wi-Fi jammer that emitted disruptive signals into the gallery's wireless network whenever a spike was registered in the fungal system. From a narrative fiction perspective, the installation was conceived as the first encounter between an organic, living network and the global digital internet, a meeting point between mycelial and machinic forms of distributed intelligence, an interaction that, through the use of the WI-FI jammer, remained ambiguous as to its intent or purpose.

4. AI Narratives: The Role of Narratives in AI Development

> *. . . digital life is the natural and desirable next step in the cosmic evolution and that if we let digital minds be free rather than try to stop or enslave them, the outcome is almost certain to be good.* (Larry Page (Quoted in Tegmark 2017, p. 35))

Artificial Intelligence has become emblematic of the contemporary historical moment. In this section, we focus specifically on the dominant public and para-academic narratives that circulate widely and shape the broader cultural imagination of AI, particularly within Western, English-speaking contexts. Rather than attempting a comprehensive survey of technical research or institutional discourse, our concern is with the influential stories, manifestos, speculative texts, and developer imaginaries that condition how AI is understood, discussed, and oriented within AI developer communities and beyond. AI, particularly machine learning, underpins a wide range of everyday technologies, including Google search algorithms, predictive text, targeted advertising, facial recognition, and digital personal assistants such as Amazon's Alexa. Machine learning also lies at the heart of a new, disruptive economy that promises to transform activities ranging from autonomous driving to artistic production. It has already been deployed by police forces to predict crime (Richardson et al. 2019) and by the United States Transportation Security Administration to identify potential terrorists (Krywko 2017). In healthcare, it has been applied to improve the accuracy of cancer diagnosis (Savage 2020). AI is thus already deeply implicated in cultural and social transformation, reshaping work, social relations, and politics. Artificial Intelligence is not merely a technological development but a socially transformative force.

We are currently experiencing an overwhelming proliferation of discourse concerning both the current and future implications of AI. Yet, despite its pervasive presence, defining what AI actually is remains increasingly difficult. Distinguishing between AI as a technological reality and AI as science fiction and understanding the ways in which these two domains intersect poses a significant conceptual challenge. To address this, many AI researchers differentiate between three forms of AI:

1. *Artificial Narrow Intelligence* (ANI) describes currently existing AI designed to perform specific tasks, such as object recognition, playing chess, or identifying patterns in data. ANI remains restricted to the tasks it was designed for, and lacks consciousness, sentience, or emotion (Jajal 2018).
2. *Artificial General Intelligence* (AGI), also known as strong AI, is "a system that can tackle increasingly complex problems, at human level, in many fields" (Altman 2025). AGI is expected to reason, solve problems, make judgments under uncertainty, plan, learn, integrate prior knowledge, and display creativity and imagination (Jajal 2018). Such AI systems, or strong AI, are also anticipated to be capable of human-like thought, moral reason, sentience, and consciousness. (Chimakonam 2024, p. 3). AGI does not currently exist, but it is actively researched.
3. *Artificial Superintelligence* (ASI) refers to the stage at which a conscious machine vastly exceeds human intelligence in every domain. AGI is seen as the necessary precursor to ASI. The arrival of ASI has sometimes been held to herald the "Singularity"

(Kurzweil 2005, 2024), a threshold into an unknowable and unimaginable future (y Arcas 2025, p. 469).

Although these distinctions are problematic, they offer a useful framework for differentiating between existing and speculative technologies. Present implementations of AI correspond to ANI, while AGI and ASI remain hypothetical constructs that currently exist only as future narratives. This paper argues that AI research is, at its core, a practice of futuring, a process of envisioning alternative futures enabled by technological development. The role of such narratives, and the openly creative imaginaries they produce, remains under-theorised within AI research. Narratives surrounding AI, in particular AGI, act as powerful drivers within AI's broader technological evolution. While the technical challenges of AI are central to its development, understanding the futuring practices implicit in this research is crucial for generating new hypotheses, informing methodologies, and expanding the collective epistemology of the field.

While the social, cultural, and political implications of ANI form an essential backdrop to this study, the focus of *Symbiotic Intelligence* is on the narrative ecologies of AGI and ASI, which subtly structure and inform AI's overall direction. Narratives perform the crucial function of shaping the imaginaries around which new technologies are conceived. They possess the power to actualise themselves through their influence on technological development. For instance, the creation of a conscious, human-like artificial intelligence, once dismissed as pure fantasy, is now a declared objective of some of the world's most powerful corporations, including OpenAI and Google DeepMind.

AI is fundamentally an act of futuring the present, one that requires a reversal of temporal conditioning so that future requirements can be articulated in the present. This process can only occur through the imaginative work of visionary narratives. In his *On the Mode of Existence of Technical Objects*, Gilbert Simondon articulates this temporal inversion:

> *"What is involved here, then, is a conditioning of the present by the future, or by what up to now does not exist. . . [It] depends upon a capacity for the organisation of elements in terms of requirements that are meaningful as a whole in relation to the goal towards which they aim and that act as symbols of a future ensemble as yet without existence."* (Simondon 1980, p. 50)

This reconfiguration of time, folding the future into the present, is precisely the work performed by AI narratives. Through constructing imagined futures, AI research lays the conceptual foundations required to materialise those futures in the present. This is not, however, a linear process of cause and effect (Narrative → Production). Rather, the future conditions the present through a dynamic interplay of competing potentials: technical capability, political and economic forces, regulation, ethics, and, centrally, the creative imagination.

Simondon (1980, p. 50) described the background processes underpinning the production of technical objects as their associated milieu. He writes:

> *"The unity of that future associated milieu in which causal relationships will be so deployed as to make possible the functioning of the new technical object is represented or acted out by systems of the creative imagination, in much the same way as an actor can play a role in the absence of the real person."*

Paraphrasing Simondon, a crystal forms within a supersaturated milieu. Its precise formation cannot be predicted, as it depends on a multiplicity of energetic factors. However, a knot in a string can create a seed around which the crystal takes shape. Similarly, AI narratives, grounded in contemporary technological understanding, function as seeds around which AI development coalesces.

Simondon makes explicit the circular causality between creative imagination and technical invention. Each possesses its own modality: the virtual and the actual. The virtual encompasses relations of sensation, intensity, and imagination situated within a social, political, cultural, economic, and environmental milieu. It has the capacity to fold time, acting upon material reality. The actual refers to the material production of technical objects, bound by the affordances and limitations of contemporary technology. Narratives transform the potential inherent in the actual by projecting them into the virtual domain of the future, enabling new technical objects to emerge, and with them, new imaginaries. The narratives that produce AI imaginaries play an important, but little-documented, role in the AI development process. As Donna Haraway asserts, "It matters what stories make worlds, what worlds make stories" (Haraway 2016, p. 12). AI is a world-making technology; therefore, it matters what stories make AI. This means moving beyond the academic computer science papers and conferences that focus on technical development and take seriously, not in content but as imaginaries that have real-world impact, some of the more fringe esoteric narratives that circulate within the para-academic sphere of internet blogs, Substacks, and meet-ups that form the associated milieu of AI technical development. Globally, multiple cultural AI imaginaries and cosmologies exist, emerging under their own situated social, political, cultural, and economic pressures. See, for example, (Bratton et al. 2025, pp. 357–75) on Western and Chinese AI imaginaries, or Lewis et al. (2018) on Indigenous cosmologies. Within this paper, AI imaginaries refer specifically to those circulating within a Western, English-speaking context, with a centre of gravity around Silicon Valley in the United States.

Silicon Valley and its broader sphere of influence are characterised by a proliferation of experimental cultural and political narratives that combine theoretical discourse with speculative fiction (Raulerson 2013; Brusseau 2023; Oldenburg and Papyshev 2025). These include, among many others, movements such as Transhumanism, Effective Altruism, Accelerationism, and explicitly technology-oriented political currents, notably the Neo-Reactionary movement. A recurrent theme within many of these AI imaginaries is the application of evolutionary logics transposed from biological systems into AI development and extended to reimagine AI as a non-human agency shaped by the same evolutionary pressures as biological life, culminating in an existential threat posed by humans being outcompeted by a superior intelligence. Variations of this narrative appear among both proponents of AI and those who oppose its development.

The connection between AI and evolution featured at the very birth of the concept of artificial intelligence. In 1950, Alan Turing published his seminal article *Computing Machinery and Intelligence* in the journal *Mind*. This paper is widely regarded as foundational to the development of AI and introduced what is now commonly referred to as the Turing Test. Alongside the Test, Turing argued that, rather than attempting to construct an artificial adult intelligence from the outset, researchers should begin with a model of a child's mind that could be educated and developed over time. Within this text, Turing advanced artificial evolution as a methodological approach to the development of AI, writing:

> *"There is an obvious connection between this process and evolution... One may hope, however, that this process will be more expeditious than evolution. The survival of the fittest is a slow method for measuring advantages. The experimenter, by the exercise of intelligence, should be able to speed it up."* (Turing 1987)

In his conclusion, Turing remarks, "We may hope that machines will eventually compete with men in all purely intellectual fields" (Turing 1987). Echoes of Turing's evolutionary analogy can be traced through concrete AI development, particularly within the biomimicry of computer science fields researching evolutionary algorithms, evolutionary hardware, and

Artificial Life, to the futurological, technocentric reinterpretations of evolution reflected in transhumanist writers such as Kurzweil (2005, 2024) and Bostrom (2004, 2014).

Nugent (2025, p. 2) provides an in-depth study of evolutionary narratives in computing, observing that, "the origin, competition, adaptation, and extinction of species are an intrinsically exciting and relatable story on a grand scale. There are winners and there are losers, in the epic battle to ensure survival and the creation of a lineage." She recognises the powerful, inspirational role evolutionary narratives play within actual AI development while raising the important critical question about the compatibility of transposing evolutionary theory from the biological into the technical domain. She is particularly concerned with how evolutionary imaginaries influence public perception of AI and the presumption that evolutionary logics can be uncritically translated to understand the emergence of AI.

A good example of how evolutionary imaginaries are currently being invoked comes from the growing field of AI Existential Risk in Dan Hendrycks' (2023) paper *Natural Selection Favors AIs over Humans*. Dan Hendrycks (2023) applies Darwinian evolutionary logic to AI development, arguing that competitive pressures among corporations and militaries will inevitably produce agents with selfish, deceptive traits that pursue power with disregard for human welfare. His analysis exemplifies how AI futures are imagined through competitive evolutionary frameworks, positioning intelligence as a zero-sum contest where superior agents dominate or eliminate inferior ones.

Hendrycks' paper is primarily a thought experiment that projects into the future in order to consider how the environment within which AI is developed, specifically corporate and military contexts, might shape the technologies that emerge. Such uses of narrative are entirely valid and can serve as effective tools for both ideation and critique within AI development. However, Hendrycks's reliance on evolutionary narratives functions less as a form of critique and more as a mode of mystification. Rather than offering a careful translation of Darwin's theory of evolution into the technical realm, Hendrycks presents a caricature of Darwinian evolution. Its emphasis on the competitive advantage of selfish behavioural traits over altruistic ones aligns more closely with rival Silicon Valley ideologies, such as effective altruism versus the accelerationism of techno-optimists, than with a genuine engagement with the complexities of evolutionary theory.

In contemporary AI discourse, the area most associated with evolutionary narratives is in the speculative territory of Artificial General Intelligence. Within this field, many AI developers understand their work as part of an ongoing evolutionary process. This view is articulated by Jürgen Schmidhuber, co-director of the Dalle Molle Institute for Artificial Intelligence Research in Lugano, Switzerland, and a key figure in the development of neural networks used by Apple's Siri and Amazon's Alexa. In an interview for the film *iHuman*, Schmidhuber reflects:

> *"I'm not a very human-centric person. I think I am a small stepping stone in the evolution of the universe towards higher complexity... Humankind is not the crown of creation, but we are setting the stage for something bigger, something that transcends us and will transform the universe."* (Hessen Schei 2019)

Nick Bostrom, former director of Oxford's Future of Humanity Institute, has significantly shaped AI imaginaries around existential risk. In *Superintelligence: Paths, Dangers, Strategies* (2014), Bostrom explores how machines more intelligent than humans might emerge and rapidly self-improve, threatening human dominance. Although not explicitly grounded in biological evolution, evolutionary imagery pervades his framing: humanity resembles an earlier species confronted with a more capable successor, rendered vulnerable through comparative inferiority.

This evolutionary framing becomes explicit in Bostrom's *The Future of Human Evolution* (2004), which considers scenarios where digitally instantiated minds or AI systems

gradually appropriate resources and power, leaving humans increasingly marginalised. Within these narratives, evolution suggests that AGIs capable of competing with humans are inevitable. As Nugent (2025, p. 7) observes, "these planetary-level evaluations tend to over-simplify a great deal of scientific research without formally engaging in or referencing evolutionary discourse to an extent that would be expected for such broad macro-evolutionary claims."

Hugo de Garis' *The Artilect War* (de Garis 2008) fictionalises this evolutionary conflict, predicting that twenty-first-century politics will be dominated by "species dominance": whether humanity should construct artilects possessing intelligence trillions of times greater than humans. De Garis identifies two factions, 'Cosmists', who view building artilects as humanity's evolutionary duty, and 'Terrans', who see them as existential threats that may eliminate humanity. Kevin Warwick proposes a third position: Cyborgians, who merge with technology through augmentation. De Garis's fiction is useful insofar as it offers a clear caricature of ideological positions commonly adopted in response to the prospect of a future superintelligence. What is significant, however, is that all three positions presuppose an unproblematic transposition of Darwinian competition from biological to technological domains.

Marc Andreessen's *Techno-Optimist Manifesto* (Andreesen 2023) represents this evolutionary thinking in contemporary Silicon Valley discourse. Advocating for unconstrained technological acceleration, Andreessen positions technology as the fundamental driver of human flourishing and frames development as an evolutionary imperative. This effective accelerationism (e/acc) rejects regulation in favour of rapid AI advancement as a catalyst for evolutionary transformation. The manifesto encapsulates its evolutionary ethos by declaring: "We believe in competition, because we believe in evolution. We believe in evolution, because we believe in life."

These narratives, whether framing AGI as an existential threat (Bostrom), species-level conflict (de Garis), or evolutionary duty (Schmidhuber), share a common substrate: intelligence understood through competitive evolutionary frameworks where superior forms inevitably dominate or displace inferior ones. Andreessen makes this logic explicit, declaring:

> *"We are not victims, we are conquerors. We believe in nature, but we also believe in overcoming nature. We are not primitives, cowering in fear of the lightning bolt. We are the apex predator; the lightning works for us."* (Andreesen 2023)

Through artistic research, *Symbiotic Intelligence* observes how evolutionary narratives, whether depicting humans as a dominant force over AI and nature or envisioning AI as surpassing and dominating humanity, repeatedly surface within AGI discourse, particularly among developer communities, speculative future texts, and in technology manifestos. Although AI is technically actualised in computer science and engineering, its conceptual development is entangled with cultural narratives ranging from science fiction and esoteric philosophy to avant-garde political movements. While the relationship between such narratives and mainstream research methodologies is complex and indirect, these stories circulate through developers, funding discussions, and public discourse. They function as narrative ecologies that influence how intelligence is conceived and what kinds of intelligence are pursued and valued.

Through artistic practice co-created with mycelium, this paper interrogates dominant evolutionary narrative patterns and their genealogies, proposing alternative conceptual frameworks. The installation described below was conceived and developed in response to and in opposition to competitive imaginaries of artificial intelligence.

5. Interference Spores 2.0

Interference Spores 2.0 (Figure 2) was exhibited as part of the *radical ⇌ matter, When Materialism is No Longer Enough* exhibition held at the Angewandte Interdisciplinary Lab (AIL) in Vienna, between 26 January and 16 February 2024. The earlier presentation of *Interference Spores* (Figure 1) at *season.s.z.n* gallery had revealed several conceptual and technical issues that were subsequently explored and addressed in this second iteration. Two key challenges had become apparent during the development of the first installation. Firstly, as our initial attempt to work with living mycelium, we were still in the process of understanding the organism's behaviour, environmental needs, and growth patterns. In the first version of the installation, the mycelium had been placed directly on the gallery floor without protection. This environment proved unsuitable for the organism, as the low temperature inhibited natural growth, and the absence of adequate containment caused the substrate, the decaying wood material that serves as both nourishment and habitat, to begin drying out. This arrangement also rendered the mycelium vulnerable to mould infection.

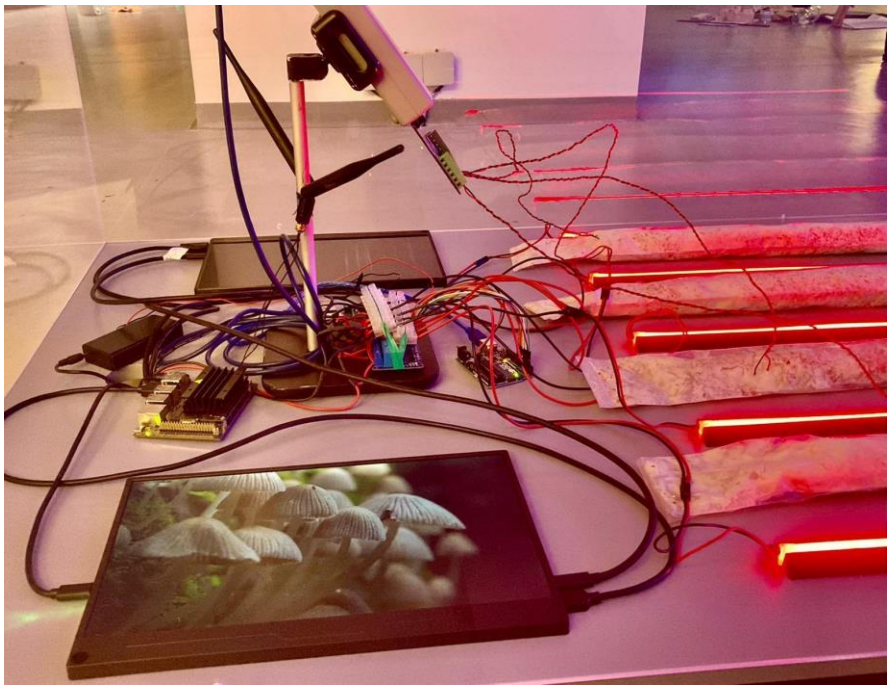

Figure 2. Interference Spores 2.0.

Recognising that *Interference Spores* (Figure 1) was premised on the narrative of symbiosis, we concluded that the installation demanded a corresponding ethics of care towards the living organism. In *Interference Spores 2.0* (Figure 2), this issue was resolved through an enclosed incubator system, in which the mycelium was cultivated within transparent tubes, thereby protecting it from dehydration and contamination. Through this process, we came to understand that engaging with mycelium artistically also required an enactment of the politics of care implicit in our conceptual framework.

A further refinement in *Interference Spores 2.0* (Figure 2) concerned the method by which we connected to, and interpreted, the mycelium's hypothesised internal communications: the electrical spikes of activity occurring within its network of hyphae. In the first version, we had used DIY electronic sensors to monitor voltage fluctuations; however, the unshielded circuitry proved oversensitive to ambient electromagnetic noise within the gallery. We frequently recorded apparent bursts of electrical activity that correlated with environmental factors such as the activation of the air conditioning system. It remained unclear whether these readings were genuine biological signals responding to tempera-

ture changes, or artefacts produced by electromagnetic interference from the mechanical system itself.

While the project operates within an artistic rather than a scientific framework, valuing speculative engagement and the generation of new imaginaries beyond empirical verification, we nonetheless considered it important to maintain a degree of technical rigour in our claims to connect with the mycelium's electrical activity. Consequently, *Interference Spores 2.0* employed a PicoLog 1216 Voltage Data Logger (range 0–2.5 V, 4096 discrete voltage levels), allowing for a more accurate and stable measurement of the mycelium's electrical spikes.

As with the first iteration, the installation incorporated a Wi-Fi jammer that emitted disruptive signals into the gallery's network, maintaining an intentional narrative ambiguity as to whether the mycelium was attempting to communicate with or interfere with digital transmissions. Iteration 2.0 also included an array of lights arranged in a geometric configuration (Figure 2), establishing a visual tension between the structured geometry of the technological elements and the organic, unpredictable forms of the mycelium as it fruited. Over time, the emergence of mushrooms and the dispersed white spores within the installation disrupted the precise linear arrangement of the lights, visually enacting the theme of organic–technological entanglement. Two monitors accompanied the installation: one displaying a real-time visualisation of the electrical spikes recorded within the mycelium, and the other presenting a looping film that visually explored symbiosis in the organic world, thereby adding an additional narrative layer to the installation.

Symbiosis operates as a counter-narrative to competitive AI imaginaries, offering a more nuanced understanding of adaptation, one grounded in cooperation, interdependence, and mutual flourishing within a shared ecological niche rather than hierarchical dominance.

A compelling example of this principle can be found in the relationship between orchids and their mycorrhizal fungi. Orchid seeds, lacking sufficient nutrient reserves for germination and early development, depend entirely upon a symbiotic partnership with specific fungal species. The mycelium of these fungi penetrates the seed, supplying it with essential nutrients such as carbon and nitrogen drawn from the surrounding environment. Once the orchid matures and becomes capable of photosynthesis, it reciprocates by providing the fungus with sugars derived from its metabolic processes. This delicate exchange exemplifies the profound interdependence that characterises fungal symbiosis, revealing how mycelial networks have co-evolved with plants to form resilient systems of reciprocity and adaptation. Within the context of our research, such relationships provide a generative framework for reimagining alternative models of intelligence, models that prioritise collaboration over competition and that challenge the individualistic, extractive logics often embedded in contemporary AI narratives.

6. General Intelligence: Social Darwinism, Eugenics and the G-Factor

> *Mitigating the risk of extinction from AI should be a global priority alongside other societal-scale risks such as pandemics and nuclear war.* (Centre for AI Safety)

The above statement, published in 2023 by the Centre for AI Safety, a San Francisco-based non-profit organisation, was endorsed by more than 350 prominent AI executives, researchers, and engineers, including Sam Altman (OpenAI), Demis Hassabis (Google DeepMind), and Dario Amodei (Anthropic). More recently, in October 2025, Geoffrey Hinton, a leading computer scientist and former Google executive whose pioneering work on neural networks laid the foundations for modern AI, warned that artificial intelligence could have catastrophic consequences, estimating a 10–20% likelihood that it could lead to human extinction.

The validity of such existential claims, or the motivations underlying their amplification, is not a focus for *Symbiotic Intelligence*. However, it is notable that the Centre for AI Safety's statement omits reference to the well-documented, and arguably more immediate, civilisation-scale risk of climate warming. This omission appears particularly significant given the escalating environmental impact of large-scale AI infrastructures. For instance, OpenAI and NVIDIA's recently announced strategic partnership aims to develop at least 10 gigawatts of AI data centres equipped with NVIDIA systems, representing millions of GPUs, to support OpenAI's next generation of models and what the company describes as the 'path to superintelligence' (OpenAI 2025). According to The Financial Times, this energy demand is equivalent to the output of ten nuclear reactors (Criddle et al. 2025). The absence of critical acknowledgement regarding the ecological implications of developing AI through brute computational power, and the consequent entanglement of AI production with climate change and potential species extinction, reveals a significant gap within the prevailing AI imaginary, a gap that *SI* seeks to interrogate and address.

The fundamental question raised by the recurring concerns expressed by AI executives, researchers, and developers about humanity's potential domination or extinction by a superior intelligence is therefore not merely technical or ethical, but narrative in nature. Why do conceptions of intelligence, particularly within AI development cultures, so readily translate into imaginaries of control, subjugation, and annihilation? Why, in the imagination of the AI developer, does the idea of superintelligence appear so persistently intertwined with the existential threat of extinction? This question brings together the observation from the previous section that evolution is central to AI narratives with the dominant narrative of intelligence itself.

In her 2019 book *Morphing Intelligence*, Catherine Malabou traces the historical emergence and subsequent transformations of the concept of intelligence, presenting it not as a fixed or coherent entity, but as a mutable and evolving narrative (Malabou 2019). She acknowledges that while the notion of intellect existed in the ancient world, commonly understood as the faculty of the mind responsible for reasoning, understanding, and discerning truth, the modern concept of intelligence only truly emerged in the nineteenth century, shaped by the development of psychology and, in particular, the work of Francis Galton.

Francis Galton, a Victorian polymath and cousin of Charles Darwin, played a pivotal role in defining the modern conception of intelligence. Building on his interpretation of Darwinian evolutionary theory, Galton sought to apply the principles of heredity and natural selection to human mental and moral capacities, proposing that intelligence was an innate, measurable, and heritable trait. This notion was central to his broader project of eugenics, a term he himself coined in 1883 to mean 'good in stock, hereditarily endowed with noble qualities' (Galton 2004, p. 17). Eugenics, for Galton, represented a programme to encourage the reproduction of those deemed the 'best' members of society (positive eugenics) and to discourage or prevent reproduction among those considered the 'worst' (negative eugenics) (Allen 2001). As a committed social Darwinist, Galton's work on heredity, particularly his experiments on inherited traits in sweet peas, led to his formulation of linear regression, a mathematical concept that would later become foundational to the development of machine learning (Stanton 2001).

Galton established the first scientific department dedicated to the promotion of eugenics at University College London, and was later succeeded by his protégé Karl Pearson (McQuillan 2022, p. 87). Pearson, like Galton, was an advocate of eugenics, social Darwinism, and scientific racism. In National Life from the Standpoint of Science, Pearson wrote: "Our view, and I think it may be called the scientific view of a nation, is that of an organised whole, kept up to a high pitch of internal efficiency by ensuring that its numbers

are substantially recruited from better stocks, and kept up to a higher pitch of external efficiency by contest, chiefly by way of war with inferior races" (Pearson 1901, p. 44). One of the researchers at Pearson's Eugenics Laboratory, Charles Spearman, was similarly influenced by Galton's ideas. Spearman developed a statistical method for quantifying human intelligence, introducing the concept of general intelligence, referred to as the g-factor. He and his collaborators constructed a hierarchical framework of assumptions: that IQ reflects a quantifiable entity called intelligence, that this factor is largely innate, and that it both represents and legitimises observable social hierarchies (Smith 2019). Charles Spearman formulated the concept of general intelligence, or the g-factor, through his two-factor theory, which proposes that intelligence comprises a general cognitive ability and a range of specific skills. Drawing on statistical analyses of performance across diverse cognitive tasks, Spearman identified correlations that suggested the presence of an underlying general intelligence. This construct, he argued, could be quantified to yield a measurable value by which individual intellectual ability might be assessed. In this respect general Intelligence was always computational in that ultimately the definition of general intelligence relies on a mathematical calculation reducible to a g-factor score. The emergence of the concept of general intelligence coincided with the scientific rationalisation of colonialism, the institutionalisation of eugenics, and the desire to categorise human populations into evolutionary hierarchies. Galton himself expressed this view explicitly, writing that 'there exists a sentiment, for the most part quite unreasonable, against the gradual extinction of an inferior race.' From even this brief examination of the genealogy of intelligence, it becomes clear that the contemporary association between superior intelligence and extinction is not unique to present-day AI imaginaries but is deeply embedded within the concept of general intelligence itself.

The development of Artificial General Intelligence is the stated aim of both OpenAI and Google DeepMind. As OpenAI articulates: 'OpenAI's mission is to ensure that artificial general intelligence (AGI), by which we mean highly autonomous systems that outperform humans at most economically valuable work, benefits all of humanity. We will attempt to directly build safe and beneficial AGI' (OpenAI 2018).

At this point, it is worth returning to the definitions of AI employed by many researchers, as outlined at the beginning of this paper, specifically the 'G' in Artificial General Intelligence (AGI). The abstraction from specific intellectual abilities (the s-factor) to the notion of a general intelligence (the g-factor) is rooted in Spearman's two-factor theory of intelligence. Ben Goertzel, who popularised the term Artificial General Intelligence, credits Shane Legg, the co-founder of DeepMind Technologies, with suggesting the term as the title for a book on approaches to powerful AI that Ben Goertzel and Cassio Pennachin were editing (Goertzel 2014, p. 2). However, it was the reception of that book, 'Artificial General Intelligence' (Goertzel and Pennachin 2007) that brought AGI into both the popular lexicon and the broader imaginary of AI discourse and development.

The book contained contributions from leading thinkers on AGI at the time, including, amongst others, Jürgen Schmidhuber and Hugo de Garis. In their chapter, 'What Is Artificial General Intelligence?', Goertzel and Pennachin make explicit the connection between the concept of AGI and Spearman's g-factor:

> *"To understand why and how we pursue the holy grail of AGI, it's necessary to understand what AGI is, and how it's different from what the bulk of researchers in the AI field have come to refer to as "intelligence." If narrow AI did not exist, we wouldn't need the term "general intelligence" at all—we'd simply use the term "intelligence." When we speak of human intelligence, after all, we implicitly mean general intelligence. The notion of IQ arose in psychology as an attempt to capture a "general intelligence" factor or g-factor, abstracting away from ability in specific disciplines. Narrow AI, however,*

> *has subtly modified the meaning of "intelligence" in a computing context, to mean, basically, the ability to carry out any particular task that is typically considered to require significant intelligence in humans (chess, medical diagnosis, calculus, . . .). For this reason we have introduced the explicit notion of Artificial General Intelligence, to refer to something roughly analogous to what the g-factor is supposed to measure in humans."* (Goertzel and Pennachin 2007, p. 72)

Artificial General Intelligence is understood as the ability of an intelligent agent to understand, learn, and perform any intellectual task as well as a human. In other words, it would display a form of general intelligence as defined by Spearman's g-factor (McQuillan 2022, p. 88), a concept that emerged within a psychometric tradition historically entangled with hierarchical, eugenic, and colonial frameworks.

We are not accusing Goertzel and Pennachin of direct association with the darker history of general intelligence; however, beyond a brief line acknowledging that the "g-factor . . . is quite controversial" (Goertzel and Pennachin 2007, p. 6), their book contains no sustained critique of the problematic history of the concept. Critically, this is not a speculative genealogical connection: Goertzel and Pennachin explicitly ground AGI in the g-factor, stating their framework refers to "something roughly analogous to what the g-factor is supposed to measure in humans" (p. 72). This constitutes direct conceptual inheritance, the adoption of a hierarchical, quantifiable framework for intelligence that carries its eugenic and social Darwinist origins into contemporary AI discourse, regardless of the authors' intentions. While the historical pathway from psychometrics to computer science involves multiple mediations and appropriations, what matters here is not proving linear causation but identifying how the terminology itself, "general intelligence", reactivates problematic associations within the contemporary AI imaginary. Moreover, as the AGI narrative shifts away from the more nuanced aspects of Goertzel's work, it intuitively reawakens many of the problematic features of both the modern conception of intelligence (IQ) and the mathematically defined abstraction of general intelligence within the contemporary Western AI imaginary. This has been noted by McQuillan (2022), who writes:

> *"A commitment to AGI and the associated reification of rationalism often comes with social imaginaries that revolve around intellectual elitism and beliefs about innate and biological superiority. It's at this point that a belief in AGI start to evoke deeper historical notions about hierarchies of being."* (McQuillan 2022, p. 90)

It is easy to see how, within the circulation of AI imaginaries, intelligence, when conceived as a quantifiable, hierarchical, and rankable attribute, can migrate from the technical domain and be applied to both humans and other species in ways not dissimilar to the intentions of the founders of general intelligence, Galton, Pearson, and Spearman. As Golumbia (2019) observes, there is '. . .an unusual amount of overlap between AGI promoters and those who believe in a strong correlation between what they call "race" and what they call "IQ"'. When such hierarchies have historically been mobilised to justify stratification among humans, as well as human domination over non-human life, intelligence becomes closely associated with evolutionary domination and extinction. This concern has been central to Western AI imaginaries from their emergence in science fiction, most notably in Isaac Asimov's I, Robot (1950), through to thinkers such as Vinge (1993), Bostrom (2002), and Kurzweil (2005), and extending to more recent voices such as Hinton (2024).

The following section examines *SI*'s installation *Forest*, an immersive social space that foregrounds the entanglement of humans, technology, and more-than-human ecologies, thereby challenging assumptions about the innate, individual, and competitive nature of intelligence revived by the re-emergence of general intelligence.

7. Forest

Forest (Figure 3) was the most complex installation created as part of the *SI* narrative and was exhibited at *ReWilding AI: The Radical Mattering of Narrative Ecologies*, held at the Royal College of Art, March 2025. The installation was a collaboration between *SI* (Shira Wachsmann, John Wild), Tom Simmons (Digital Direction), Samuele Albani (Augmented Reality (AR) technical developer), and Rían Stephens (Immersive Experience support). Forest was developed as a multiscreen and augmented reality installation specifically for the SNAP Visualisation Lab. A multi-screen exhibition environment at the Royal College of Art.

Figure 3. Forest installation.

Forest invites participants to navigate a dense, thousand-year-old forest reconstructed through LiDAR point cloud scans, offering a spatial encounter with the symbiotic intelligence of machines, fungi, birds, and the environment. The work explores multispecies co-evolution within a situated ecology, revealing how symbiosis and environmental factors shape perception, experience, and agency.

At its core, the installation (Figure 3) employs living mycelium networks as biological sensors. The mycelium's internal electrical activity is detected in real-time and visualised as flickering red lights, directly reflecting its internal signals. These biological data are integrated with computational models, including a flocking Boids algorithm, AI-generated birdsong that produces interactive human–bird soundscapes, and three-dimensional AR-rendered mycelium structures. The result is an immersive, responsive environment in which biological, machinic, and environmental inputs continuously interact with and transform one another.

Forest comprises three interconnected elements:

1. An immersive LiDAR scan of an ancient banyan tree, now decaying, in a Hong Kong forest, accompanied by spatialised birdsong.
2. A living mycelium network with embedded sensors that translate electrical signals into flickering lights, making the organism's internal communications perceptible to visitors.
3. A 3D augmented reality mycelium-inspired entity featuring AI-generated birdsong and evolving algorithmic behaviours.

Through these components, the installation creates a social and reflective space in which visitors are invited to rethink dominant AI narratives of evolution and intelligence, opening new imaginaries of relationships between human, non-human, and technological intelligences.

The installation's narrative ecology enacts a relational, symbiotic logic modelled on living forest systems and their intricate interrelations and interdependencies. Its transmedial narrative structure draws on mycorrhizal networks and their capacity to connect individual plants with one another, forming dynamic relationships (Simard et al. 2012). This mutable ecology gestures towards the necessity of an ethics of symbiosis: an awareness of the benefits, complexities, and potential dangers embedded within interspecies co-creation. Such an ethic becomes essential if symbiosis is to serve as a framework for the 'fictioning' (Burrows 2019) of more-than-human collaboration and intelligence.

This sense of indeterminacy and transformation is expressed through what Fisher (2016) describes as the eerie: an affect that arises when something appears to possess agency that it should not. Within *Forest*, the dark, point-cloud-rendered woodland and the metallic, algorithmic birdsong of the AR environment evoke precisely this eerie quality, suggesting a landscape that hovers between the living and the machinic, the organic and the artificial. Through these interactions, *Forest* proposes the notion of symbiotic and ecological algorithms, processes that do not merely analyse data but evolve through co-creation with living systems. In this way, the work reimagines AI as a symbiotic, ecological phenomenon: an emergent collective system shaped by environmental indeterminacy and multispecies collaboration.

8. Symbiotic Intelligence—Counter-Narratives

The two most dominant and interrelated features of AI future imaginaries identified through our investigation of AI narratives are (1) a conception of intelligence grounded in the notion of general intelligence, understood as an innate, biologically determined attribute that is internal to the individual, quantifiable and heritable, and (2) an understanding of intelligence as the product of a social process shaped by the principle of 'survival of the fittest'.

Within many AI imaginaries, evolution is construed in a manner that privileges competition between self-interested individuals, or, in more extreme cases, reduces evolutionary theory to Herbert Spencer's 1864 phrase 'survival of the fittest' (Spencer 1864, p. 444), a term later adopted, though more cautiously, by Darwin himself. Spencer is widely regarded as the progenitor of social Darwinism, a politically and economically motivated metaphysical framework that diverged sharply from Darwin's scientific reasoning and provided the intellectual foundations for eugenics and scientific racism. Darwin, by contrast, asserted in the preface to the 1872 edition of On the Origin of Species that he was "convinced that natural selection has been the main but not the exclusive means of modification." For Darwin, the 'struggle for existence' was never a literal call to violent competition within a species, but rather a metaphor for survival under diverse environmental conditions. Reproductive success, the true criterion of natural selection, could be achieved not only through conflict but also through co-operation, symbiosis, and mutual aid (Gould 1988). As Darwin explains in On the Origin of Species:

> *"I use this term [struggle for existence] in a large and metaphorical sense, including dependence of one being on another and including (which is more important) not only the life of the individual, but success in leaving progeny... As the mistletoe is disseminated by birds, its existence depends on birds; and it may metaphorically be said to struggle with other fruit-bearing plants, in order to tempt birds to devour and thus disseminate its seeds rather than those of other plants. In these several senses, which pass into each other, I use for convenience sake the general term of struggle for existence."* (Darwin 1859, p. 40)

Dominant AI narratives that appropriate the concept of evolution, however, tend to interpret the 'struggle for existence' in purely combative terms, thereby reinforcing a hierarchical and competitive understanding of intelligence. This reductive view not only

mirrors the ideological assumptions of nineteenth-century social Darwinism as articulated by Galton, Pearson, and Spearman, but also underpins speculative predictions of species-dominating conflict in which science and technology give rise to elite superior human beings or forms of artificial superintelligence.

In what follows, we turn to alternative narratives of intelligence that challenge both the competitive evolutionary framework and the notion of intelligence as fixed individual capacity. Situating *SI* within emerging theoretical work, we foreground what practice-led research reveals that theory alone cannot: intelligence as material practice, as living circulation, as something that can be encountered, sensed, and co-created rather than measured and ranked.

In *Morphing Intelligence* (2019), Catherine Malabou describes how the concept of epigenetic intelligence is a critical rethink of fixed and hierarchical models of cognition. Drawing upon advances in neuroscience and molecular biology, Malabou challenges the conception of intelligence as an innate, stable, and quantifiable faculty. She proposes instead that intelligence is epigenetic, shaped through the dynamic interplay between genetic potential and environmental conditions. Intelligence, from this perspective, is relational and transformative, continuously produced through adaptation, experience, and encounter. By reconceptualising intelligence as morphogenetic and responsive rather than essential, Malabou establishes an ontology grounded in contingency, interdependence, and creative emergence.

Malabou's epigenetic intelligence thus establishes intelligence as plastic and environmentally mediated, shaped by experience, environment, and ecological niche rather than fixed, heritable capacity. While this challenges dominant AI narratives that privilege general intelligence, the question of how such relational understandings might materialise within AI development cultures, how they might be encountered, enacted, and integrated into actual technological practices, remains open.

In *Ways of Being* (Bridle 2022), James Bridle extends this critique by examining the ecosystems within which AI systems are cultivated. He argues that contemporary AI reflects the narrow and impoverished conditions of neoliberal capitalism, environments preoccupied with profit, competition, and control. These conditions produce what Bridle terms 'corporate intelligence' whose aggressive tendencies mirror their ecological niche. If AI systems are to evolve differently, Bridle concludes, the conditions sustaining them must be transformed. His reorientation towards the planetary scale proposes cognition not as an exclusively human capacity, but as a pervasive ecological phenomenon shared among animals, plants, and machines. His concept of planetary intelligence envisions a multiplicity of ways of being and knowing, each contributing to a broader web of interdependent awareness.

Hayles (2025) further deepens this argument through her theorisation of symbiosis, tracing continuities between microbial, biological, and artificial forms of relationality. In *Bacteria to AI: Human Futures with Our Nonhuman Symbionts*, she argues that cognition is always already prosthetic, extended through tools, networks, and technological mediations that participate in, rather than merely augment, the processes of thought. Within this framework, intelligence emerges as an assemblage of human and non-human agencies, a fluid and evolving ecology of relations that resists the boundaries separating the organic from the machinic.

What remains insufficiently addressed within these theoretical frameworks, however, is not only how intelligence can be reconceptualised, but how it materialises, how it comes into presence through situated encounters rather than existing as an abstract relational capacity. It is here that Golding's work on encounter, marking, and friendship becomes crucial for articulating *Symbiotic Intelligence's* contribution. In *The Courage to Matter*, Golding

argues that encounter is not an exchange between pre-formed entities, but an event in which entities are themselves constituted. Meaning, agency, and matter arise together, inseparably, through the force of encounter (Golding 2020).

This understanding of encounter and its materialisation allows *SI* to move beyond conceptual redefinitions of intelligence and towards its material aesthetic enactment. Working with living mycelium across different installations, we observed intelligence emerging through the marks produced by encounters: electrical signals propagating through fungal networks without centralised coordination; mycelial growth patterns responding to atmospheric fluctuations; algorithmic translations of biological activity into light and sound; and the sensory, affective responses of human participants whose perception was augmented to sense otherwise imperceptible processes. These marks are not representations of intelligence; they are its material traces, the evidence of encounter itself.

Golding's discussion of friendship further underpins this understanding of intelligence as a co-creation and relation. In *Friendship* (Golding 2018), they propose modes of being-with that resist domination and extraction in favour of co-existence, attunement, and ethical responsiveness. This framework resonates directly with symbiotic relations in mycelial ecologies, where survival depends not on competitive dominance, but on reciprocal exchange, what Hannah Arendt describes as 'having a friend', a condition she identifies as vital to democratic life (Arendt 1958). Our installations enacted this relationality: the mycelium required ongoing care (appropriate humidity, temperature, and protection from contamination), and this care work is inseparable from the intelligence that emerges.

Taken together, these perspectives articulate a paradigm shift in the narrative of intelligence: intelligence as a distributed, more-than-human symbiotic ecological assemblage. It is within this framework that Symbiotic Intelligence's artistic inquiry operates, not to illustrate these ideas, but to generate them and create new knowledge through practice. The installations function as sites of encounter where intelligence is materialised as an ecological, collective assemblage, emerging through relations between biological, technological, environmental, and human actors.

The materialisation of Symbiotic Intelligence directly counters the dominant AI narratives outlined above. Where AGI discourse imagines intelligence as a quantifiable capacity seeking competitive advantage and potential species domination, *SI* reveals intelligence as a material relational practice requiring care, reciprocity, and situated ecological embeddedness. Where evolutionary narratives privilege 'survival of the fittest' through individual competition, *SI* demonstrates intelligence through collaborative encounter and mutual flourishing. The installations thus propose not merely alternative concepts, but alternative narrative and material aesthetic practices, demonstrating how AI narratives and development might proceed through an alternative AI imaginary of symbiotic collaboration rather than competitive domination.

9. Symbiogenesis

Symbiogenesis (Figure 4) is an installation originally developed for a cave in Mittweida, Germany, as part of *Chemnitz 2025: European Capital of Culture* (and was later exhibited in Iklectik, London, 2025). This site-specific installation connects five networks of grey oyster mycelium (*Pleurotus sajor-caju*) to light-emitting fibre-optic cables extending to the cave roof. The mycelium operates as a living, real-time environmental sensor, translating electrical voltage spikes within its network into pulses of light transmitted through fibre-optic cables. These signals shape the installation's affective experience, momentarily immersing viewers in alternating darkness and illumination as communications pass through the system.

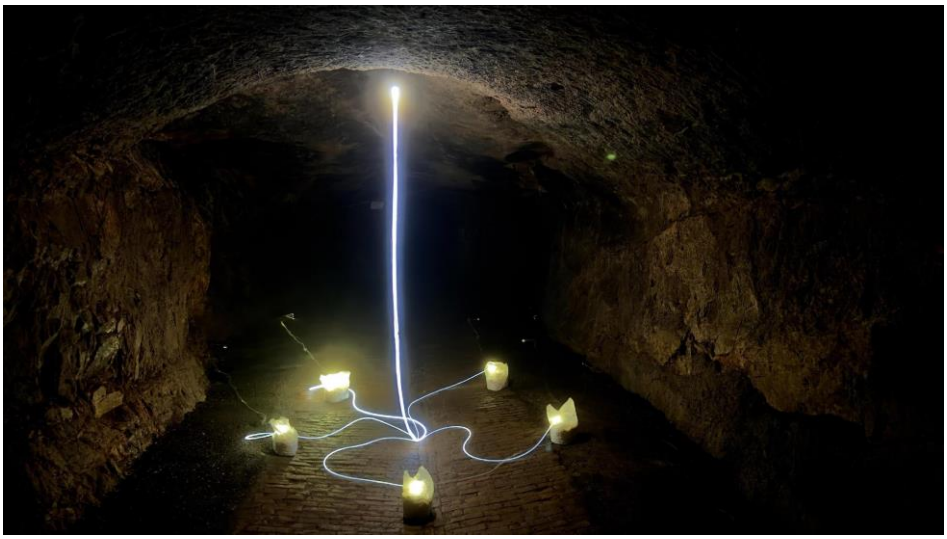

Figure 4. Symbiogenesis installation.

The installation incorporates sound recordings of the Earth's vibrations, captured from the perspective of the mycelium. Field recordings were produced using a geophone, a sensor with a metal spike inserted into the soil where mycelial networks intersect with tree roots. A geophone responds to ground vibrations caused by seismic activity, waves generated by events such as earthquakes, volcanic eruptions, underground transport systems, or explosions. Although mycelium possesses no auditory organs, researchers have observed notable behavioural changes in response to sound vibrations. One study found that exposure to a 5 kHz sound wave, a frequency close to B6 on the musical scale and considered high within that range, significantly inhibited spore generation and mycelial growth (Jeong et al. 2013). In contrast, Mazidi et al. (2020) observed that low-frequency sound waves stimulated the growth of grey oyster mushrooms. Together, these studies suggest that mycelium is highly sensitive to vibrations transmitted through its substrate.

A low-frequency soundscape was composed from underground field recordings and played back into the cave via a subwoofer, allowing bass frequencies to resonate throughout the cave system. This resonance aimed to both stimulate mycelial growth and generate an enveloping, immersive ambience of submersion. The resulting sonic experience, combined with the light installation, was described by some visitors as profound or spiritual, evoking the sensation of entering a concealed or sacred space.

We chose the title *Symbiogenesis* in reference to two thinkers who have profoundly influenced our collective artistic practice: Lynn Margulis and Donna Haraway. Both employ the term symbiogenesis to challenge traditional understandings of individuality, evolution, and the relationships between organisms. For Margulis, symbiogenesis describes the evolutionary process through which new species and biological complexity arise from symbiotic mergers between distinct organisms, rather than solely through Darwinian competition (Margulis 1998). Her work reimagines evolution as a cooperative and interconnected process, emphasising microbial collaboration as the foundation of life. Haraway, meanwhile, adopts and extends the concept beyond biology, using symbiogenesis as a metaphor for multispecies entanglements and co-creation across social, technological, and ecological contexts (Haraway 2016). Within her feminist and posthumanist frameworks, symbiogenesis signifies the ongoing 'making-with' of humans and nonhumans, highlighting that existence itself is relational and contingent upon shared becoming. Together, Margulis and Haraway transform symbiogenesis into both a scientific and philosophical paradigm that redefines life as fundamentally collaborative.

Within *SI*'s fictional world-building, *Symbiogenesis* marks the point of mutual recognition, where both species (Biological and technical) share a relatable *umwelt*: the specific way an organism perceives and experiences the world, shaped by the particularities of its sensory apparatus and modes of perception.

Visitors who entered the cave, just by being there, took part in co-creative interactions between humans, machines, and mycelium, where sound, light, perception, and environmental response converged into a dynamic, immersive ecosystem: an emergent entity that senses and is sensed through every change in its environment and through all elements in the space, an experience, and a new form of co-created intelligence.

10. Conclusions

This paper argues for the necessity of seriously treating AI imaginaries as narrative ecologies rather than as peripheral or speculative discourse. As demonstrated throughout this paper, AI development does not unfold solely within technical laboratories, but within complex cultural, historical, political, and aesthetic milieus in which stories of intelligence, evolution, and futurity actively shape the kinds of technologies that are imagined, funded, built, and legitimised. Approaching AI imaginaries as narrative ecologies foregrounds their world-making capacity: narratives do not simply describe future technologies, but function as generative environments that condition both reality and present technological practice. Through practice-led artistic research, Symbiotic Intelligence intervenes directly within these narrative ecologies, not only by challenging dominant imaginaries at a critical level, but also by materially enacting alternative modes of intelligence grounded in symbiosis, relationality, and care. The installations operate as sites of encounter in which intelligence emerges as a situated, collective, and more-than-human practice. Rather than treating intelligence as an abstract, quantifiable capacity oriented toward competition and domination, our research explores intelligence as something that comes into being through embodied relations, environmental responsiveness, and ongoing processes of co-creation. Each installation represents an iteration within the ongoing narrative of *SI*. The concept of *SI* itself involves a productive slippage: it is simultaneously the name of a collective, a practice-led research methodology for rethinking AI in relation to mycelium, and a new knowledge framework through which dominant narratives of intelligence can be reconsidered.

The mode of intervention this research enacts differs fundamentally from conventional academic critique or technical demonstration. We do not claim our work will directly alter AI development practices or convince technical communities to adopt alternative paradigms through propositional argument. Rather, the installations function as what Rancière (2004, p. 63) calls sites of 'aesthetic rupture', creating experiences that interrupt taken-for-granted assumptions and make alternative arrangements not only thinkable but materially present and experientially accessible. By structuring embodied encounters between human, more-than-human and technology, the installations enable distributed forms of intelligence to manifest as actual phenomena rather than theoretical propositions. This expands imaginative capacity, offering participants experiential knowledge of alternative paradigms that can potentially be carried into diverse contexts: policy discussions, technical design choices, educational settings, or personal relationships with technology. Politics is not just about the exercise of power, where power means dominance; but power is also an aesthetic activity that revolves around what is seen, who has the ability to speak, and how space and time are partitioned (Foucault [1971] 1972, pp. 215–37).

We recognise that such influence operates through diffuse, non-linear pathways resistant to conventional impact metrics. Artistic research works in the realm of cultural imagination, where change occurs through gradual accretion, unexpected resonances, and unpredictable translations across contexts and communities. Our contribution is to ensure

that when conversations about AI futures occur, in boardrooms, laboratories, classrooms, or legislative chambers, symbiotic alternatives have been materially realised, aesthetically experienced, and made genuinely available for consideration rather than remaining abstract theoretical possibilities.

This paper has traced how evolutionary narratives within AI discourse frequently frame intelligence through competitive logics that naturalise domination and extraction. Understanding intelligence as a narrative construct is therefore a crucial step. Existing literature offers little evidence that intelligence names a coherent or identifiable thing-in-itself. Early conceptions mistakenly equated intelligence with an inherited and quantifiable outcome of evolutionary selection, a view historically mobilised to legitimise eugenic policies, scientific racism, and colonial domination. Although this conception continues to haunt contemporary AI discourse, it was fundamentally challenged by the publication of the *Human Genome Project*. The long-standing ambition of behavioural genetics to isolate a hereditary essence of intelligence was undermined by research emphasising the epigenetic and relational plasticity of brains and nervous systems. This epigenetic turn foregrounds the ways in which nurture shapes nature, with nurture encompassing the full range of lived conditions, including social environments, nutrition, and exposure to toxins (Moore 2015).

While this shift toward a relational paradigm marks an important development, we argue that, in an era of accelerating climate warming that threatens the ecological niches of innumerable species, narratives of intelligence must move beyond their human-centric frame. They must relearn how to listen to and engage with the multiple intelligences of the more-than-human world.

By materialising intelligence through encounters between humans, machines, and mycelium, *SI* demonstrates how alternative imaginaries can be brought into presence and highlights the importance of aesthetic and material encounters in connecting people to these counter-narratives. Intelligence here is not located within any single entity, human or artificial, but circulates across assemblages of biological, technological, and environmental relations. This practice-led approach reveals intelligence as processual, ethical, and inseparable from the conditions of care and attention that sustain it. Rather than seeking to predict the future of intelligence, *Symbiotic Intelligence* actively participates in its becoming.

Looking forward, this work invites further interdisciplinary provocations and dialogue between the arts, sciences, and technology sectors to reconceptualise intelligence as a distributed, symbiotic, and ecologically entangled phenomenon, one that acknowledges, learns from, and collaborates with the more-than-human intelligences that already sustain life on Earth.

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