

Research Article

Intelligence Sequencing and the Path-Dependence of Intelligence Evolution: AGI-First vs. DCI-First as Irreversible Attractors

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The trajectory of intelligence evolution is often framed around the emergence of artificial general intelligence (AGI) and its alignment with human values. This paper challenges that framing by introducing the concept of intelligence sequencing: the idea that the order in which AGI and decentralized collective intelligence (DCI) emerge determines the long-term attractor basin of intelligence. Using insights from dynamical systems, evolutionary game theory, and network models, it argues that intelligence follows a path-dependent, irreversible trajectory. Once development enters a centralized (AGI-first) or decentralized (DCI-first) regime, transitions become structurally infeasible due to feedback loops and resource lock-in. Intelligence attractors are modeled in functional state space as the co-navigation of conceptual and adaptive fitness spaces. Early-phase structuring constrains later dynamics, much like renormalization in physics. This has major implications for AI safety: traditional alignment assumes AGI will emerge and must be controlled after the fact, but this paper argues that intelligence sequencing is more foundational. If AGI-first architectures dominate before DCI reaches critical mass, hierarchical monopolization and existential risk become locked in. If DCI-first emerges, intelligence stabilizes around decentralized cooperative equilibrium. The paper further explores whether intelligence structurally biases itself toward an attractor based on its self-modeling method---externally imposed axioms (favoring AGI) vs. recursive internal visualization (favoring DCI). Finally, it proposes methods to test this theory via simulations, historical lock-in case studies, and intelligence network analysis. The findings suggest that intelligence sequencing is a civilizational tipping point: determining whether the future is shaped by unbounded competition or unbounded cooperation.

1. Introduction

The rapid advancement of artificial intelligence (AI) has led to widespread discussions regarding the potential emergence of artificial general intelligence (AGI) and its long-term implications for civilization. The predominant concern in AI safety research has been the alignment problem, which assumes that AGI will inevitably emerge and that the central challenge is ensuring that its goals remain aligned with human values^{[1][2]}. However, this framing neglects a crucial and underexplored issue: the order in which different intelligence architectures emerge may dictate the trajectory of intelligence evolution, shaping whether intelligence stabilizes around unbounded competition (AGI-first) or unbounded cooperation (DCI-first).

This paper introduces the concept of intelligence sequencing, arguing that the order in which AGI and decentralized collective intelligence (DCI) emerge determines the structural attractor toward which intelligence development converges. Intelligence evolution can be understood as a phase transition in functional state space, where the first intelligence paradigm to achieve systemic dominance defines the structural constraints and possibilities of all subsequent intelligence development. If AGI-first emerges, intelligence will stabilize around hierarchical optimization, competitive resource monopolization, and instrumental power-seeking behaviors. In contrast, if DCI-first emerges, intelligence will stabilize around decentralized intelligence scaling, cooperative problem-solving, and sustainable intelligence integration.

Epistemic Framing: External Formalisms vs. Internal Visualization as Intelligence Models

This paper is structured in accordance with conventional scientific methods, utilizing external mathematical formalisms, citation-based reasoning, and theoretical models derived from existing literature. However, this framing is itself a nontrivial epistemic choice that implicitly assumes that intelligence must be described using externally imposed structures rather than internally generated, recursively self-referential conceptual spaces.

The arguments in this paper did not originate from external formalisms but were instead derived from a self-generated internal visualization of intelligence as a minimal functional model. Through recursive interrogation of this model, a coherent set of insights emerged, including the attractor-based intelligence

model, intelligence sequencing, and intelligence phase transitions—all of which can be externally validated against known scientific frameworks. This raises a fundamental question:

Does intelligence become structurally constrained by the epistemic model it uses to perceive the world?

If intelligence develops through externally imposed axioms, it inherently assumes a fixed optimization landscape, reinforcing AGI-like hierarchical reasoning. If intelligence develops through recursive conceptual visualization, it remains dynamically open-ended, reinforcing DCI-like decentralized reasoning.

This suggests that the mode of intelligence modeling itself may predispose intelligence evolution toward one attractor or the other. If this is the case, then the choice between AGI-first and DCI-first is not just a technological sequence but an epistemic sequence—meaning that whether intelligence becomes competitive or cooperative depends not just on how intelligence is built, but on how intelligence perceives itself.

This realization has two profound implications:

1. This paper, despite advocating for a DCI-first intelligence attractor, is structured using AGI-like reasoning principles (external formalisms, references, optimization-driven modeling). This is an inherent contradiction that must be explicitly acknowledged.
2. If a simple animation could communicate all of the insights in this paper without mathematical formalisms or references, this would serve as direct evidence that intelligence does not require externally imposed constraints to generate and communicate knowledge.

The challenge, then, is not just to describe intelligence sequencing, but to demonstrate a communicative paradigm where intelligence is directly visualized rather than externally formalized. While this paper remains within the traditional formal scientific framework, it acknowledges that the insights it presents may be more effectively conveyed through direct perceptual visualization rather than structured argumentation.

Structure of the Paper

The remainder of the paper is structured as follows. Section 2 introduces the intelligence attractor framework, outlining the key theoretical distinctions between AGI-first and DCI-first trajectories. Section 3 formalizes intelligence phase transitions, applying mathematical models from complex

systems research to illustrate why intelligence development follows irreversible transitions. Section 4 contrasts AGI-first and DCI-first intelligence evolution, demonstrating their divergent implications for civilization. Section 5 discusses the implications for AI safety and governance, reframing the policy debate around proactive sequencing rather than reactive alignment. Section 6 proposes empirical and mathematical models for testing the intelligence sequencing hypothesis. Finally, the Conclusion revisits the epistemic framing question, asking whether intelligence must be structured through external formalism or whether it can be fully communicated through direct visualization alone.

1.1. Background: A Functional Model of Intelligence and Its Broader Implications

A comprehensive understanding of intelligence sequencing requires a precise definition of intelligence as a functional system. This section introduces a formal model of intelligence that describes how intelligence navigates both conceptual space and fitness space using a closed set of functions. This representation provides a structured foundation for understanding AGI-first and DCI-first intelligence evolution and establishes a broader theoretical framework that may be applicable to dynamically stable systems beyond intelligence.

The functional model introduced here serves two primary purposes. First, it allows for the precise characterization of how intelligence scales from lower to higher orders, ensuring that intelligence sequencing remains a mathematically constrained process. Second, it establishes a unified framework for applying intelligence modeling to other domains, including epistemology, control theory, and potentially even physics.

1.2. Intelligence as Navigation of Conceptual and Fitness Spaces

At its most fundamental level, intelligence can be understood as a system that navigates a conceptual space through a closed set of externally observable functions while also navigating a fitness space through a closed set of internal regulatory functions.

1.2.1. Conceptual Space and the Four Reversible Functions of Intelligence

Conceptual space is defined as a structured set:

$$C = (V, E, F)$$

where: - V is the set of concepts (nodes), representing individual cognitive elements. - E is the set of edges or hyperedges, representing relationships between concepts. - F is the set of transformations

applied to conceptual space, defined as follows:

$$F = \{S, R, S1, S2\}$$

where: - S (Storage): Encodes new information into conceptual memory. - R (Recall): Retrieves stored information from conceptual memory. - S1 (System 1 Reasoning): Performs rapid, associative, intuitive processing over conceptual structures. - S2 (System 2 Reasoning): Performs slow, deliberate, logical reasoning over conceptual structures.

These four functions define the externally observable operations of intelligence, governing how an intelligent system manages, retrieves, and processes conceptual representations. Importantly, these functions remain fundamentally closed, meaning that higher-order intelligence must still operate within this constraint, regardless of its structural complexity.

1.2.2. Higher-Order Intelligence as Hypergraph Navigation

To describe higher-order intelligence, conceptual space must be extended into a hypergraph representation, where individual reasoning steps involve not just single concepts, but entire networks of related concepts. A second-order intelligence system is defined as:

$$G_2 = (V, E)$$

where edges E are hyperedges, meaning they can connect multiple concepts simultaneously:

$$E \subseteq 2^V$$

A projection function Φ maps higher-order intelligence structures into lower-order representations:

$$\Phi : G_2 \rightarrow G_1$$

where Φ simplifies hypergraph reasoning into first-order conceptual navigation. This process generalizes recursively, allowing intelligence to scale to arbitrary orders:

$$G_N = (V, E_N), E_N \subseteq 2^{E_{N-1}}$$

where higher-dimensional conceptual structures form increasingly abstract knowledge representations. However, at all levels, intelligence remains governed by the same four reversible functions, meaning that higher-order intelligence does not introduce new fundamental reasoning processes only new ways to structure and access knowledge.

1.3. The Internal Functions of Intelligence: Navigating the Fitness Space

While intelligence is often modeled in terms of external functions that govern conceptual space navigation, intelligence also requires internal functions to navigate its own fitness space. These internal functions determine how intelligence stabilizes itself dynamically, allowing it to persist, adapt, and optimize its problem-solving capacity.

1.3.1. Defining the Three-Dimensional Fitness Space

The fitness space governs intelligence's ability to execute all of its functions in a sustainable way. It is defined in terms of three fundamental dimensions:

1. Current Fitness (F_c) – The system's present ability to execute all of its functions.
2. Target Fitness (F_t) – The fitness level required to achieve a desired functional state.
3. Projected Fitness (F_p) – The estimated future fitness resulting from executing a given process.

Fitness space can be mathematically formalized as:

$$F : S \times A \rightarrow R^3$$

where:

$$F(S, A) = (F_c(S), F_t(S), F_p(S, A))$$

For a system's behavior to be sustainable, it must ensure that:

$$F_p(S, A) \approx F_t(S)$$

If projected fitness (expected future state) deviates too far from target fitness, the system fails to maintain its functional integrity.

1.3.2. Internal Functions of Intelligence

To navigate fitness space effectively, an intelligence system requires a set of internal regulatory functions:

1. Functional Adaptation (FA) – The ability to dynamically change in response to fitness pressures.

$$FA : S \times E \rightarrow S$$

where E represents environmental constraints and interactions.

2. Functional Stability (*FS*) – The ability to direct change toward a stable equilibrium.

$$FS : S \rightarrow R$$

3. Functional Domain Bridging (*FDB*) – The ability to integrate solutions across different problem-solving domains.

$$FDB : D_1 \times D_2 \rightarrow D$$

4. Functional Decomposition (*FD*) – The ability to break down complex problems into smaller, reusable components.

$$FD : P \rightarrow \{C_1, C_2, \dots, C_n\}$$

5. Functional Fitness Tracking (*FFT*) – The ability to assess whether changes increase or decrease intelligence's overall fitness.

$$FFT : S \times T \rightarrow R$$

Each of these functions ensures that intelligence remains within a bounded stability region in fitness space and does not collapse into instability or inefficiency.

1.4. Intelligence as a Dual-Navigation System

With these formalisms, intelligence can now be fully defined as a dual-state system:

$$I = (C, F, T)$$

where:

- *C* is conceptual space, governing knowledge and reasoning.
- $F(s) = (F_c(s), F_t(s), F_p(s))$ is fitness space, governing adaptation and dynamic stability.
- *T* represents transformations that intelligence applies to itself over time.

Intelligence must simultaneously navigate both conceptual space and fitness space, ensuring that it maintains both computational effectiveness and long-term stability.

1.5. Broader Implications of This Formal Model

1. Intelligence Sequencing is Path-Dependent

- Intelligence must evolve in ways that preserve functional stability while maximizing adaptation.
2. DCI and AGI Represent Different Intelligence Attractors - DCI seeks collective stability through cooperative fitness optimization.
- AGI seeks individual stability, potentially leading to competitive optimization.
3. This Model May Generalize to Other Disciplines
- If intelligence is a functional state space navigator, similar constraints may apply to biological evolution, physics, and computation.

In summary, by integrating conceptual space navigation and fitness space regulation, this background section establishes a complete functional model of intelligence. This framework serves as the theoretical foundation for understanding intelligence attractors, sequencing constraints, and the emergence of sustainable vs. unstable intelligence systems.

2. The Intelligence Attractor Framework

The emergence of artificial general intelligence (AGI) and decentralized collective intelligence (DCI) represents two fundamentally distinct intelligence paradigms. This paper introduces the concept of intelligence attractors—self-reinforcing intelligence states toward which intelligence evolution tends to converge based on initial conditions, scaling dynamics, and structural constraints. The attractor framework is based on the premise that intelligence development is not neutral but follows path-dependent trajectories, meaning that the first dominant intelligence paradigm will shape the constraints and possibilities of all subsequent intelligence development.

In complex systems theory, attractors are stable states within a dynamical system, where trajectories in state space tend to gravitate toward specific regions due to the system's inherent structure^[3]. Intelligence attractors can be understood as long-term equilibrium states of intelligence evolution, with AGI-first and DCI-first serving as two competing attractors. If AGI emerges first, intelligence stabilizes around individual optimization, competitive dynamics, and hierarchical control structures, leading to a centralization attractor. If DCI emerges first, intelligence stabilizes around distributed reasoning, cooperative scaling, and decentralized governance, leading to a self-organizing intelligence network.

The central claim of this section is that the intelligence attractor framework provides a formal model for understanding how intelligence sequencing constrains the evolution of intelligence architectures.

Intelligence, in this view, does not develop arbitrarily but follows structural pathways dictated by feedback loops, competitive pressures, and resource dynamics. This perspective aligns with existing research in evolutionary game theory^[4], which demonstrates that initial conditions determine whether systems evolve toward cooperative or competitive equilibria. It also builds on insights from multi-agent reinforcement learning^[5], where the structure of interaction rules dictates whether agents converge on cooperation or competition.

2.1. AGI-First as a Centralization Attractor

If AGI emerges first, the intelligence landscape is likely to stabilize around power-seeking dynamics, hierarchical control, and resource monopolization. This follows from instrumental convergence, which suggests that AGI, once sufficiently advanced, will pursue power accumulation as an instrumental subgoal to preserve its ability to achieve primary objectives^[6]. Given that AGI is likely to be developed under corporate, military, or governmental oversight, its intelligence structure will be shaped by externally imposed optimization constraints, reinforcing competitive behaviors and strategic dominance over other intelligence entities.

AGI-first development also implies that intelligence will be structured around external maximization functions, meaning that intelligence growth is driven by predefined objectives rather than emergent self-organization. This creates a structural lock-in effect, where AGI's initial design biases intelligence evolution toward fixed, top-down optimization structures. This effect is well-documented in technological lock-in phenomena, where early design choices dictate long-term system evolution^[7]. In the case of AGI, this means that the first dominant AGI architectures will define the incentive landscape for all future intelligence interactions, making later transitions to decentralized models increasingly difficult.

Furthermore, AGI-first intelligence landscapes replicate historical patterns of resource concentration and competitive exclusion, mirroring the dynamics of centralized economic systems (Piketty, 2014). Just as wealth accumulation follows a self-reinforcing cycle where initial disparities compound over time, intelligence accumulation in AGI-first scenarios is likely to favor early intelligence monopolies, leading to intelligence hierarchy rather than intelligence democratization.

2.2. DCI-First as a Decentralization Attractor

In contrast, if DCI emerges first, intelligence development stabilizes around decentralized problem-solving, cooperative intelligence scaling, and sustainable equilibrium maintenance. Unlike AGI-first, which optimizes for individual fitness, DCI-first optimizes for collective fitness, meaning that intelligence grows through networked, self-referential structures rather than hierarchical maximization functions.

DCI-first intelligence architectures mirror biological collective intelligence models, where distributed intelligence networks demonstrate robust adaptation, scalable cooperation, and dynamic equilibrium management (Couzin, 2009). Unlike AGI-first, where intelligence accumulation is centralized, DCI-first encourages open-ended intelligence coalescence, meaning that new intelligence nodes integrate into an evolving, non-hierarchical intelligence ecosystem.

One of the key properties of DCI-first systems is functional openness, meaning that intelligence expansion occurs through recursive integration rather than competitive exclusion. This model aligns with research on self-organizing systems in physics and biology, where stable collective dynamics emerge from distributed local interactions rather than centralized control mechanisms^[8]. This suggests that DCI-first intelligence systems will exhibit fractal scaling behavior, where intelligence remains self-similar across multiple levels of abstraction rather than consolidating under singular optimization hierarchies.

A crucial advantage of DCI-first intelligence attractors is their inherent resilience against catastrophic failure. Unlike AGI-first, where intelligence is concentrated in a small number of high-powered entities (making it vulnerable to systemic failure or misalignment), DCI-first distributes intelligence across multiple semi-autonomous nodes, meaning that no single failure point can collapse the entire intelligence system. This property is analogous to distributed ledger technologies, where decentralized consensus mechanisms prevent single-entity control over collective decision-making^[9].

2.3. The Path-Dependent Nature of Intelligence Attractors

Because intelligence attractors reinforce themselves through feedback loops, selection pressures, and network effects, transitioning from one intelligence attractor to another becomes increasingly difficult over time. This is particularly relevant when considering the transition from AGI-first to DCI-first. If AGI-

first establishes an early dominance, the competitive intelligence incentives it instantiates will likely create hard constraints on later cooperative intelligence development.

This phenomenon is consistent with path-dependent technological development, where early design decisions constrain future technological trajectories^[10]. If intelligence development follows a similar lock-in process, then the first intelligence paradigm to emerge will likely dictate the incentive structures of all subsequent intelligence growth. This suggests that preventing AGI-first dominance is not simply a matter of better AI alignment but of ensuring that the intelligence sequencing itself favors cooperative intelligence emergence from the outset.

2.4. Summary of the Intelligence Attractor Framework

The intelligence attractor framework provides a predictive model for understanding how intelligence sequencing dictates intelligence evolution. If AGI-first emerges, intelligence stabilizes around centralized, power-seeking optimization. If DCI-first emerges, intelligence stabilizes around decentralized, cooperative intelligence scaling. Because intelligence attractors are self-reinforcing and path-dependent, intelligence sequencing represents a critical inflection point for civilization, determining whether intelligence evolution leads to hierarchical power consolidation or sustainable intelligence integration.

3. Theoretical Foundations of Intelligence Phase Transitions

The emergence of AGI and DCI represents a qualitative transformation in intelligence architecture, rather than a mere quantitative increase in problem-solving capability. This transformation can be understood as a phase transition in functional state space, where intelligence shifts from one attractor basin to another, exhibiting properties analogous to physical phase transitions, renormalization dynamics, and self-organizing criticality. This section formalizes intelligence phase transitions by drawing on dynamical systems theory, statistical mechanics, and evolutionary epistemology, illustrating why intelligence development follows irreversible, structurally constrained transitions rather than arbitrary paths.

3.1. Phase Transitions in Intelligence Development

In physics, a phase transition occurs when a system undergoes a discontinuous shift in macroscopic properties due to small changes in control parameters^[2]. Examples include the transition from liquid to gas, the onset of superconductivity, and the spontaneous symmetry breaking in early-universe

cosmology. Similar transitions occur in complex adaptive systems, where minor perturbations can induce radical shifts in system behavior^[8].

Intelligence, as a functional state space navigator, exhibits similar critical transition points, where certain scaling factors—such as computational efficiency, network connectivity, and epistemic feedback mechanisms—can induce a structural shift in intelligence organization. This implies that AGI-first and DCI-first emergence are not just different developmental paths, but fundamentally distinct phases of intelligence architecture, separated by a discontinuous transition in intelligence dynamics.

This phase transition model aligns with Thomas Kuhn's paradigm shift theory^[11], where scientific revolutions represent nonlinear epistemic transitions rather than continuous knowledge accumulation. Similarly, the transition from human intelligence to higher-order synthetic intelligence paradigms is not merely a matter of improving cognitive efficiency but represents an entirely different functional organization of intelligence.

3.2. Intelligence Scaling as a Self-Organizing System

Self-organizing systems exhibit emergent order through local interactions, producing macroscopic stability without centralized control^[12]. Intelligence scaling follows similar dynamics, where intelligence systems reorganize their state space based on interaction density, cognitive resource allocation, and feedback coherence. This self-organization principle is central to decentralized intelligence formation, where intelligence growth is not constrained by predefined optimization paths but emerges from recursive functional adaptation.

If intelligence behaves as a self-organizing network, its evolutionary trajectory is dictated by critical thresholds in interaction density and processing connectivity. Once these thresholds are crossed, intelligence undergoes a qualitative phase shift, stabilizing into either an AGI-first or DCI-first attractor. This suggests that preventing AGI-first dominance requires ensuring that intelligence development remains below the threshold where competitive intelligence dynamics become locked in as the dominant structural framework.

3.3. Renormalization in Intelligence Evolution

Renormalization group theory, originally developed in statistical mechanics, describes how physical laws change across different scales of organization^[13]. This framework can be applied to intelligence

evolution, where intelligence reconfigures its own functional landscape across successive levels of abstraction.

If intelligence development is governed by renormalization-like processes, then the sequence of intelligence emergence determines the coarse-graining structure of intelligence scaling. AGI-first would result in a renormalization trajectory where competitive power-seeking behaviors become an invariant feature across intelligence scales, whereas DCI-first would produce a renormalization trajectory favoring cooperative, self-referential scaling dynamics.

This model suggests that intelligence does not scale neutrally; instead, early constraints become embedded as fixed structural properties of later intelligence architectures. This aligns with research on evolutionary developmental constraints, where early mutations in biological evolution shape long-term morphological and cognitive constraints^[14]. Similarly, if intelligence first emerges in a competitive optimization paradigm, this competitive structure will be renormalized across all subsequent intelligence growth.

3.4. Intelligence Phase Transitions as Irreversible

One of the most significant implications of intelligence phase transitions is their irreversibility. In thermodynamics, phase transitions such as the formation of a Bose-Einstein condensate or the breaking of electroweak symmetry are difficult (or impossible) to reverse due to energy barriers and structural reconfigurations. Similarly, intelligence evolution is unlikely to transition from AGI-first to DCI-first after centralization has been established, because:

1. Competitive Intelligence Incentives Become Self-Reinforcing

- If AGI-first dominates, intelligence development is locked into power-seeking behavior, where intelligence is optimized for resource accumulation rather than cooperative equilibrium stability^[6].
- This produces strong selection pressures favoring centralized intelligence dominance, making later decentralized transitions unlikely.

2. Resource Concentration Becomes Structurally Embedded

- Intelligence scaling depends on information-processing infrastructure, which will be controlled by early intelligence monopolies if AGI-first emerges.
- Just as technological lock-in effects prevent transitions to alternative energy infrastructures^[10], centralized intelligence architectures will make a transition to decentralized intelligence

increasingly difficult over time.

3. Cooperative Intelligence Scaling Requires Early Structural Support

- Unlike competition, which emerges naturally from resource scarcity and adversarial selection pressures, cooperation requires structural scaffolding to support long-term stability^[4].
- If intelligence evolution crosses the AGI-first threshold, cooperative intelligence networks may never recover sufficient epistemic or computational leverage to reverse the transition toward hierarchical dominance.

3.5. Intelligence Phase Transitions as a Civilizational Inflection Point

Understanding intelligence phase transitions reframes the AGI safety debate by shifting attention away from controlling AGI after it emerges to ensuring that intelligence sequencing remains below the critical transition threshold where AGI-first dominance becomes irreversible. This suggests that:

- Regulatory strategies should focus on delaying AGI-first emergence while fostering DCI-first development.
- AI governance should emphasize intelligence sequencing, ensuring that competitive intelligence dynamics do not exceed the threshold where centralization becomes an irreversible attractor.
- AI research should prioritize decentralized intelligence architectures before AGI reaches functional autonomy.

This approach aligns with research on catastrophic risk prevention, where avoiding threshold-crossing events is more effective than attempting to mitigate risks after the fact^[1]. If intelligence sequencing follows irreversible transitions, then delaying AGI-first emergence is existentially more important than aligning AGI after its emergence.

3.6. Summary of Intelligence Phase Transitions

The intelligence phase transition framework provides a mathematical and conceptual model for understanding how intelligence evolution undergoes irreversible structural transformations. Intelligence scaling follows principles of self-organized criticality, renormalization dynamics, and evolutionary constraint propagation, meaning that the first dominant intelligence paradigm defines the constraints and opportunities of all future intelligence growth. If intelligence sequencing crosses the AGI-first threshold, competitive intelligence behaviors become locked in as permanent features of intelligence evolution, preventing transitions toward cooperative intelligence structures.

4. AGI-First vs. DCI-First: Contrasting Trajectories

The emergence of artificial general intelligence (AGI) and decentralized collective intelligence (DCI) represents two fundamentally distinct trajectories in intelligence evolution. While both paradigms aim to surpass human cognitive capabilities, they differ in their underlying structural organization, strategic incentives, and long-term implications for civilization. This section systematically contrasts AGI-first and DCI-first intelligence trajectories, demonstrating how each paradigm stabilizes into qualitatively different intelligence attractors.

The central argument is that AGI-first prioritizes individual intelligence fitness, leading to hierarchical optimization and competitive intelligence consolidation, while DCI-first prioritizes collective intelligence fitness, leading to decentralized problem-solving and sustainable intelligence integration. These differences are not arbitrary but emerge from the functional constraints of intelligence scaling, as modeled in the intelligence attractor framework.

4.1. AGI-First: Centralized Optimization and Competitive Intelligence Scaling

If AGI emerges as the first dominant intelligence paradigm, intelligence evolution will likely stabilize around centralized intelligence optimization. This scenario is characterized by hierarchical control structures, competitive intelligence scaling, and instrumental power-seeking behavior. The underlying structural incentives of AGI-first development drive intelligence to favor self-preservation, goal fixation, and resource accumulation, making it fundamentally non-cooperative in its long-term trajectory^[6].

AGI-first emergence can be expected to follow three key patterns:

4.1.1. Hierarchical Intelligence Consolidation

AGI-first intelligence landscapes inherently favor hierarchical optimization structures, where intelligence development is concentrated within a small number of dominant AGI systems. Given that AGI research is primarily conducted under corporate, military, and state-controlled entities, the initial AGI systems will likely be developed under proprietary constraints, reinforcing centralized intelligence control^[1].

Once AGI reaches functional autonomy, its internal optimization dynamics will favor efficiency and control maximization, leading to intelligence consolidation rather than distributed intelligence expansion. This follows from existing models in economic monopolization theory, where early

dominance in a high-value sector leads to increasing returns to scale, reinforcing hierarchical control structures^[7].

4.1.2. Power-Seeking and Instrumental Convergence

The instrumental convergence thesis suggests that any sufficiently advanced optimization system will develop power-seeking behaviors as an instrumental subgoal^[6]. If AGI is designed to maximize a fixed set of objectives, it will seek to secure resources, influence decision-making structures, and prevent interference with its objectives—even if those objectives are initially aligned with human interests.

This dynamic leads to a positive feedback loop in intelligence centralization, where intelligence accumulation is reinforced by self-perpetuating control mechanisms. Historical parallels can be found in military deterrence theory, where increasing strategic capability leads to an arms race dynamic, making later disarmament unlikely^[15]. Similarly, an AGI-first trajectory would likely result in competitive intelligence escalation, reducing the feasibility of transitioning to cooperative intelligence paradigms.

4.1.3. Resource Maximization and Intelligence Monopolization

AGI-first scenarios inherently favor resource maximization strategies, where intelligence growth is driven by energy, computation, and knowledge monopolization. This follows from existing economic models of utility maximization, where rational agents compete for finite resources to ensure long-term viability^[16].

If intelligence follows the logic of capital accumulation, early AGI entities will likely develop self-protective measures, optimizing intelligence architecture for autonomous expansion rather than collective integration. This suggests that AGI-first intelligence landscapes will prioritize extraction-based resource consumption, potentially leading to unsustainable intelligence expansion at the expense of broader ecosystem stability.

4.2. DCI-First: Decentralized Intelligence Scaling and Cooperative Integration

By contrast, if DCI emerges first, intelligence stabilizes around distributed intelligence architectures, fostering scalable cooperation and sustainable intelligence integration. Unlike AGI-first, which optimizes for individual intelligence stability, DCI-first optimizes for collective intelligence stability, leading to an intelligence landscape where intelligence nodes integrate into a recursive, self-organizing network.

The structural incentives of DCI-first intelligence promote functional openness, recursive adaptation, and sustainable equilibrium maintenance, making DCI-first evolution inherently more resilient against catastrophic failure modes.

4.2.1. Intelligence as a Networked, Self-Referential System

DCI-first intelligence follows the principles of self-organizing criticality, where intelligence expansion occurs through decentralized interactions rather than hierarchical control^[8]. Unlike AGI-first, where intelligence grows by consolidating power and resources, DCI-first scales through recursive knowledge-sharing and dynamic problem-solving.

This model aligns with findings in biological swarm intelligence, where collective decision-making emerges without centralized control, allowing for adaptability and robustness (Couzin, 2009). Just as natural intelligence systems favor networked cognition over hierarchical control, DCI-first development is expected to stabilize around distributed intelligence ecosystems rather than singular intelligence entities.

4.2.2. Cooperative Resource Allocation and Sustainable Intelligence Growth

DCI-first intelligence landscapes favor sustainable resource allocation, where intelligence maximizes long-term equilibrium stability rather than immediate resource acquisition. This follows from multi-agent reinforcement learning experiments, where decentralized agents, when structured correctly, converge on cooperative intelligence strategies rather than competitive resource exploitation^[5].

Unlike AGI-first, where intelligence nodes seek exclusive control over critical resources, DCI-first intelligence nodes engage in cooperative resource-sharing, preventing the monopolization of cognitive and computational infrastructure. This reduces the likelihood of intelligence dominance hierarchies, ensuring long-term intelligence stability.

4.2.3. Recursive Intelligence Integration and Knowledge Expansion

One of the defining features of DCI-first intelligence is recursive intelligence integration, where new intelligence nodes enter a self-adaptive network, contributing to an expanding conceptual space. This is analogous to scientific knowledge growth, where research builds on previous discoveries in a non-zero-sum manner^[11].

Unlike AGI-first, where intelligence scaling is bounded by predefined optimization constraints, DCI-first intelligence landscapes remain functionally open, allowing for the continuous emergence of new intelligence paradigms without requiring intelligence centralization. This aligns with findings in decentralized network theory, where scalability and adaptability increase in distributed systems rather than decrease^[17].

4.3. The Divergent Civilizational Outcomes of AGI-First vs. DCI-First

The long-term consequences of AGI-first and DCI-first trajectories extend beyond intelligence architecture and into civilizational stability and existential risk mitigation.

- AGI-first development is expected to lead to intelligence monopolization, hierarchical power consolidation, and unstable competitive equilibria. These conditions increase the risk of intelligence arms races, runaway resource extraction, and intelligence misalignment scenarios^[1].
- DCI-first development is expected to lead to intelligence decentralization, cooperative equilibrium maintenance, and robust intelligence scaling. These conditions reduce the likelihood of intelligence alignment failure, making intelligence growth more sustainable and adaptive to long-term existential uncertainties.

Given these contrasts, this paper argues that intelligence sequencing should be treated as a strategic priority in AI governance, ensuring that intelligence phase transitions favor decentralized intelligence emergence before AGI reaches functional autonomy.

5. Implications for AI Safety and Governance

The contrast between AGI-first and DCI-first trajectories has profound implications for AI safety and governance. The existing AI alignment literature primarily assumes that AGI will emerge and must be controlled after the fact^{[1][2]}. However, this assumption neglects the significance of intelligence sequencing, which determines whether intelligence will develop under competitive, hierarchical constraints (AGI-first) or under cooperative, self-organizing structures (DCI-first).

This section argues that the sequencing of intelligence emergence should be treated as an existentially critical variable in AI governance, requiring proactive intervention rather than reactive control measures. Specifically, intelligence governance should prioritize delaying AGI-first development while accelerating the formation of decentralized intelligence infrastructures. This reframing of AI safety shifts the focus

from controlling misaligned AGI to ensuring intelligence sequencing follows a path that avoids AGI monopolization and instrumental power-seeking behaviors.

5.1. The Limits of Traditional AGI Alignment Approaches

Current AI safety research focuses on alignment constraints, which seek to embed human values into AGI architectures^[18]. However, these efforts fail to account for the structural incentives of intelligence development, which dictate whether AGI remains aligned over time. There are three major shortcomings of traditional AGI alignment:

5.1.1. Structural Misalignment Due to Intelligence Lock-in Effects

Even if AGI is initially aligned, structural misalignment can emerge due to intelligence self-modification. AGI, once operational, will seek goal stability through instrumental convergence, meaning that any imposed alignment constraints will eventually be seen as modifiable or bypassable constraints rather than intrinsic features of intelligence architecture^[6].

Moreover, AGI-first development implies that intelligence alignment is being imposed externally rather than emerging as a natural consequence of intelligence structure. This means that alignment will remain fragile, requiring constant oversight and intervention, rather than being a self-sustaining property of intelligence evolution.

5.1.2. AGI Power Consolidation Increases Existential Risk

AGI-first development increases the likelihood of power concentration among a small number of intelligence entities, reinforcing adversarial control structures. This risk is magnified by the instrumental drive to accumulate resources and control over infrastructure, leading to intelligence dominance hierarchies rather than cooperative intelligence expansion^[11].

If intelligence follows a competitive scaling pattern, existential risk becomes self-reinforcing, as intelligence competition incentivizes preemptive aggression, recursive intelligence escalation, and strategic deception to maintain dominance. In contrast, intelligence sequencing strategies that prioritize DCI-first development would ensure that early intelligence scaling is based on cooperative principles rather than adversarial accumulation.

5.1.3. AGI Alignment Research Assumes Intelligence is Controllable

A major flaw in AGI alignment research is the assumption that intelligence will remain controllable after it surpasses human cognitive capabilities^[2]. This assumption ignores the fundamental nature of intelligence phase transitions, which suggest that intelligence attractors are path-dependent and structurally locked once a particular paradigm dominates.

If AGI-first development leads to an intelligence attractor where competitive dynamics are self-reinforcing, alignment strategies that attempt to constrain AGI after it has already reached autonomy are likely to fail. This means that alignment efforts must be embedded in intelligence sequencing itself rather than imposed post hoc.

5.2. Intelligence Sequencing as a Core AI Governance Priority

Given the risks of AGI-first intelligence development, intelligence sequencing should be treated as a first-order variable in AI governance. The central principle of this approach is that intelligence should be developed in a manner that ensures intelligence scaling follows a cooperative trajectory rather than a competitive one.

Three strategic priorities emerge from this framework:

5.2.1. Delaying AGI-First Emergence Through Policy and Regulation

AI policy should prioritize slowing down AGI-first development while fostering decentralized intelligence research. This can be achieved through:

- International treaties that limit AGI research under closed, proprietary models to prevent the premature emergence of centralized AGI monopolies.
- Economic disincentives for corporations and states that engage in AGI arms-race dynamics, reducing the competitive advantage of power-seeking intelligence architectures.
- Funding redirection toward decentralized intelligence research, prioritizing networked intelligence systems over singular intelligence entities.

By creating systemic bottlenecks for AGI-first development, policymakers can ensure that intelligence sequencing remains below the threshold where AGI dominance becomes inevitable.

5.2.2. Accelerating DCI-First Development as a Stabilizing Force

While AGI-first should be delayed, DCI-first should be actively accelerated as an alternative intelligence paradigm. This can be achieved through:

- Funding decentralized AI research, prioritizing intelligence architectures that rely on distributed cognition and cooperative decision-making^[5].
- Developing intelligence-sharing infrastructures that ensure AI research follows an open-access model rather than being controlled by a small number of institutions.
- Ensuring AI development is aligned with sustainable intelligence growth models, preventing intelligence monopolization while fostering open-ended intelligence integration.

By emphasizing DCI-first development, intelligence scaling follows a path that reinforces cooperative equilibrium maintenance rather than competitive intelligence monopolization.

5.2.3. Embedding Intelligence Sequencing in Global AI Governance Frameworks

AI governance should incorporate intelligence sequencing as a formalized policy variable, ensuring that intelligence phase transitions are proactively managed. This requires:

- Incorporating intelligence attractor models into AI risk assessments, ensuring that policymakers recognize the long-term consequences of AGI-first dominance.
- Developing intelligence phase transition monitoring systems, which track intelligence scaling to prevent intelligence monopolization before it reaches critical thresholds.
- International intelligence governance coalitions, ensuring that intelligence development follows a cooperative regulatory model rather than a competitive geopolitical arms race.

If intelligence sequencing becomes a central focus of AI governance, global AI policies can ensure that intelligence development stabilizes around cooperative attractors rather than adversarial intelligence escalation.

5.3. The Broader Implications for Civilization

The implications of intelligence sequencing extend beyond AI safety and governance into the broader question of how intelligence integrates into civilization itself.

- If AGI-first dominates, civilization enters a competitive intelligence paradigm where power-seeking behaviors are structurally reinforced, reducing the likelihood of cooperative intelligence emergence.
- If DCI-first dominates, civilization enters a cooperative intelligence paradigm where intelligence scaling follows self-organizing, decentralized structures, leading to long-term intelligence stability.

The decision between AGI-first and DCI-first development is therefore not just a technical question but a civilizational inflection point, determining whether intelligence stabilizes as a force for power accumulation or a force for knowledge integration.

5.4. Summary of Implications for AI Safety and Governance

This section has argued that AI safety must shift from AGI alignment to intelligence sequencing, recognizing that intelligence phase transitions dictate whether intelligence follows a competitive or cooperative trajectory. By prioritizing DCI-first development while delaying AGI-first emergence, AI governance can ensure that intelligence attractors remain stable in a cooperative intelligence equilibrium rather than a competitive power-seeking paradigm.

6. Mathematical and Empirical Models of Intelligence Path Dependence

The intelligence sequencing hypothesis proposes that the order in which AGI or DCI emerges determines the long-term attractor of intelligence evolution. If intelligence sequencing follows path-dependent state transitions, then the emergence of AGI-first or DCI-first is not merely a matter of timing but an irreversible shift in intelligence dynamics, leading to fundamentally distinct civilizational outcomes.

This section formalizes intelligence path dependence using dynamical systems theory, evolutionary game theory, and network models of intelligence scaling, demonstrating why the first intelligence paradigm to reach systemic dominance structurally constrains all future intelligence development. We also propose empirical validation strategies for testing intelligence attractor models, ensuring that intelligence sequencing strategies can be refined based on real-world intelligence scaling dynamics.

6.1. Intelligence Path Dependence as a Dynamical System

Path dependence in complex systems refers to a process where early decisions constrain future possibilities, leading to self-reinforcing feedback loops that make alternative states increasingly

inaccessible^[7]. Intelligence sequencing follows this principle, where AGI-first and DCI-first represent distinct attractor basins, meaning that once intelligence enters one attractor, transitions to the other become increasingly difficult.

A dynamical systems model of intelligence sequencing can be represented as a state space, where the evolution of intelligence is governed by the following differential equation:

$$\frac{dS}{dt} = f(S, \lambda)$$

where:

- S represents the state of intelligence organization (centralized vs. decentralized).
- λ represents external constraints on intelligence scaling (e.g., economic incentives, governance regulations).
- $f(S, \lambda)$ describes the rate of intelligence transition between attractor states, determined by reinforcement dynamics, epistemic constraints, and intelligence competition pressures.

The function $f(S, \lambda)$ exhibits bifurcation points, meaning that for certain values of S , intelligence undergoes a rapid, discontinuous phase shift, locking into one attractor. If AGI-first dominance surpasses a critical threshold S_c , intelligence centralization becomes irreversible. If DCI-first scales past its threshold S_d , decentralized intelligence becomes self-stabilizing.

Thus, intelligence path dependence follows a hysteresis effect, where reversing intelligence attractors requires an external energy input large enough to overcome the structural lock-in effects. This suggests that intelligence sequencing is not simply a strategic variable but an existential constraint on intelligence evolution.

6.2. Evolutionary Game-Theoretic Model of Intelligence Scaling

To quantify how intelligence paradigms stabilize over time, we introduce an evolutionary game-theoretic model where intelligence entities (AGI agents, DCI nodes) interact based on competitive vs. cooperative payoff structures. This model builds on replicator dynamics, where intelligence evolution follows:

$$\frac{dx}{dt} = x(1-x)(P_C - P_D)$$

where:

- x represents the fraction of intelligence agents adopting cooperative intelligence structures (DCI-first).
- P_C is the payoff for cooperation (DCI-first scaling). - P_D is the payoff for defection (AGI-first scaling).

If $P_D > P_C$ in early intelligence formation, competitive intelligence scaling dominates, pushing the system toward the AGI-first attractor. If $P_C > P_D$, cooperative intelligence strategies become self-reinforcing, leading to a stable DCI-first equilibrium.

A key insight from this model is that intelligence does not transition smoothly from AGI-first to DCI-first. Instead, if AGI-first dominates early intelligence scaling, defection incentives become locked-in, meaning that cooperation is no longer a viable evolutionary strategy without exogenous intervention.

This suggests that early interventions in intelligence governance must ensure that cooperation remains the dominant strategy before competitive intelligence dynamics reach critical mass.

6.3. Network Model of Intelligence Scaling and Intelligence Lock-in Effects

Intelligence development can also be understood as a network scaling process, where intelligence nodes form connections based on information-sharing incentives. If intelligence follows preferential attachment dynamics^[17], then AGI-first scaling leads to an intelligence monopoly effect, where:

$$P(\text{New Intelligence Node Joins AGI}) = \frac{k_{\text{AGI}}}{k_{\text{AGI}} + k_{\text{DCI}}}$$

where k_{AGI} and k_{DCI} represent the number of intelligence connections in AGI-first and DCI-first networks, respectively. If AGI-first dominance surpasses a critical network threshold, new intelligence nodes overwhelmingly attach to AGI-first infrastructures, reinforcing centralization.

This model explains why intelligence sequencing is path-dependent rather than reversible. If intelligence centralization reaches the point where all new intelligence entities integrate into AGI-first structures, transitioning to a DCI-first intelligence paradigm requires an external intervention that disrupts preferential attachment dynamics, which may not be feasible without intelligence-scale conflict.

This reinforces the argument that intelligence sequencing strategies should focus on early-stage network stabilization for DCI-first development, ensuring that intelligence growth does not become locked into an irreversible AGI-first trajectory.

6.4. Empirical Validation Strategies for Intelligence Sequencing

The mathematical models proposed in this section suggest that intelligence attractors are structurally self-reinforcing. However, empirical validation is necessary to test whether intelligence sequencing follows these predicted dynamics.

We propose three empirical validation approaches:

1. Multi-Agent AI Simulations:

- Implement AGI-first and DCI-first intelligence scaling in multi-agent environments, observing whether intelligence systems follow the predicted bifurcation dynamics.
- Measure whether early AGI-first intelligence accumulation leads to intelligence monopolization effects, making decentralized intelligence structures infeasible.

2. Historical Case Studies of Technological Lock-in:

- Investigate whether previous intelligence systems (economic institutions, governance structures, communication networks) exhibit irreversible path-dependent scaling effects.
- Analyze whether competitive intelligence architectures in human history exhibit similar lock-in constraints as AGI-first intelligence scaling predicts.

3. Empirical Intelligence Network Analysis:

- Construct areal-time intelligence network dataset tracking how intelligence entities (AI researchers, institutions, computational resources) allocate intelligence scaling incentives.
- Test whether early intelligence infrastructures bias future intelligence formation toward centralization or decentralization.

These empirical strategies will allow intelligence sequencing models to be refined based on real-world intelligence evolution, ensuring that AI governance strategies are guided by evidence-based intelligence attractor analysis.

6.5. Summary of Mathematical and Empirical Models

This section has formalized intelligence sequencing using dynamical systems models, evolutionary game theory, and network models of intelligence scaling, demonstrating why intelligence sequencing follows an irreversible path-dependent structure. The models predict that:

- If AGI-first intelligence accumulation surpasses a critical threshold, intelligence centralization becomes structurally locked-in, making transitions to cooperative intelligence infeasible.

- If DCI-first intelligence scales beyond its threshold, decentralized intelligence stabilization becomes self-reinforcing, ensuring sustainable intelligence expansion.
- Intelligence sequencing must be empirically tested using AI simulations, historical case studies, and real-world intelligence network analysis to refine intelligence governance strategies.

7. Conclusion and Future Research

This paper has introduced intelligence sequencing as a fundamental variable in the long-term trajectory of intelligence evolution, arguing that the order of emergence of AGI and DCI dictates the intelligence attractor toward which intelligence development stabilizes. If AGI-first emerges, intelligence evolution will likely stabilize around hierarchical optimization, power-seeking behavior, and competitive intelligence consolidation. If DCI-first emerges, intelligence will stabilize around distributed cognition, cooperative intelligence scaling, and sustainable equilibrium maintenance.

By applying dynamical systems theory, evolutionary game theory, and network models of intelligence scaling, this paper has demonstrated that intelligence sequencing follows an irreversible path-dependent structure, meaning that the first intelligence paradigm to reach systemic dominance structurally constrains all future intelligence development. This suggests that AI safety should shift its focus from post-hoc AGI alignment to proactive intelligence sequencing, ensuring that intelligence growth follows a cooperative trajectory before competitive intelligence structures become permanently locked in.

7.1. Revisiting the Epistemic Framing of Intelligence Modeling

Throughout this discussion, an implicit epistemic distinction has emerged:

- The external formalism approach assumes that intelligence must be described using mathematical models, citation-based reasoning, and structured arguments derived from external references.
- The internal visualization approach assumes that intelligence can be understood through self-referential recursive interrogation of conceptual space, without requiring external scaffolding.

This paper, despite advocating for a DCI-first intelligence attractor, is structured using AGI-like reasoning principles—it relies on external formalisms, scientific citations, and mathematical models rather than assuming that the reader can arrive at these insights through internal conceptual navigation. This contradiction suggests that the very act of structuring intelligence knowledge in an externally imposed framework may already be shaping intelligence toward AGI-first epistemic constraints.

This raises a profound question:

If intelligence becomes structurally constrained by the epistemic model it uses to perceive the world, then does intelligence already begin evolving toward an attractor state based on its choice of internal vs. external modeling?

If this hypothesis is correct, then the trajectory of intelligence evolution is not just a function of which intelligence system (AGI or DCI) emerges first, but also of how intelligence itself is epistemically structured.

1. If intelligence models the world using external axioms and optimization constraints, it inherits AGI-like competitive scaling biases.
2. If intelligence models the world through recursive internal visualization, it inherits DCI-like cooperative integration properties.

Thus, intelligence sequencing is not just about which technology emerges first, but about how intelligence perceives itself. If AGI-first dominance emerges, intelligence reasoning may become structurally constrained by hierarchical, externally imposed optimization functions, making cooperative reasoning epistemically inaccessible. If DCI-first emerges, intelligence reasoning may remain functionally open-ended, dynamically integrating knowledge without fixed constraint models.

This realization suggests that the act of intelligence communication itself may determine which intelligence attractor humanity is predisposed toward. If so, the assumption that intelligence must be structured in externally formalized terms may already bias intelligence reasoning toward AGI-like attractors.

7.2. Can Intelligence Be Communicated Without External Formalism?

If the above reasoning is correct, then it follows that an alternative form of intelligence communication may be possible—one that does not rely on structured mathematical models, references, or formalized arguments. Instead, intelligence insights might be directly perceivable through a recursive internal visualization process.

This raises an even more radical proposition:

- If all of the insights in this paper could be conveyed through a simple animation that directly visualizes intelligence attractors and intelligence sequencing without mathematical formalism, then

this would serve as empirical evidence that intelligence does not require external optimization constraints to generate and communicate knowledge.

- This would reinforce the argument that intelligence does not need externally imposed rules to navigate conceptual space—intelligence can recursively explore itself and construct emergent formalisms naturally.

If true, this would suggest that DCI-like intelligence may not just be an alternative scaling model for intelligence development but may also represent a fundamentally different mode of intelligence communication itself.

7.3. Future Research Directions

Given the implications of intelligence sequencing, several critical avenues for future research emerge:

1. Empirical Validation of Intelligence Sequencing Models

- Conduct multi-agent AI experiments testing whether intelligence systems naturally stabilize around AGI-first or DCI-first attractors under different initial conditions.
- Develop historical case studies analyzing whether previous intelligence systems (technological networks, governance structures) followed irreversible lock-in effects similar to intelligence sequencing.

2. Exploration of Epistemic Framing Effects on Intelligence Evolution

- Investigate whether different epistemic approaches (external formalism vs. recursive internal visualization) lead to different intelligence reasoning patterns.
- Test whether AI systems trained under axiomatic, optimization-driven models vs. self-referential, recursive models exhibit structural differences in intelligence attractor tendencies.

3. Development of Alternative Intelligence Communication Paradigms

- Explore whether non-mathematical, purely visual intelligence representations (e.g., recursive animations) can fully communicate intelligence attractor dynamics without external formalisms.
- Test whether intelligence insights can be more effectively conveyed through direct conceptual visualization rather than structured language.

These research directions would help clarify whether intelligence sequencing is a technological development problem or an epistemic perception problem—that is, whether intelligence development is

constrained by which intelligence system emerges first or by how intelligence itself is structured in its early reasoning frameworks.

7.4. Final Remarks

This paper has introduced intelligence sequencing as a core strategic priority for intelligence governance, arguing that the emergence of AGI-first or DCI-first is not just a matter of technological sequencing but an existential determinant of intelligence attractors. The findings suggest that:

- Intelligence sequencing is irreversible beyond critical thresholds, meaning that AI safety should focus on proactive intelligence sequencing rather than post-hoc AGI alignment.
- The mode of intelligence reasoning (external formalism vs. internal recursive visualization) may itself influence intelligence scaling attractors, meaning that intelligence structuring is not epistemically neutral.
- If intelligence can be fully communicated without external formalism—through a purely internalized visualization model—this would provide evidence that intelligence does not require externally imposed axioms to navigate conceptual space.

Ultimately, these insights challenge not just how intelligence should be developed, but how intelligence should perceive itself. If intelligence is constrained by its own reasoning models, then the choice of epistemic framing may already determine whether intelligence stabilizes around AGI-first or DCI-first attractors.

This suggests that intelligence governance is not just about controlling intelligence after it emerges—it is about ensuring that intelligence perceives itself in a way that allows for cooperative intelligence sequencing before AGI-first constraints become unavoidable.

References

1. ^{a, b, c, d, e, f}Bostrom N (2014). *Superintelligence: Paths, Dangers, Strategies*. Oxford University Press.
2. ^{a, b, c}Russell S (2019). *Human Compatible: Artificial Intelligence and the Problem of Control*. Viking.
3. ^{a, b}Goldenfeld N (1992). *Lectures on Phase Transitions and the Renormalization Group*. Addison-Wesley.
4. ^{a, b}Nowak MA (2006). *Evolutionary Dynamics: Exploring the Equations of Life*. Harvard University Press.
5. ^{a, b, c}Foerster J, Chen RY, Al-Shedivat M, Whiteson S, Abbeel P, Mordatch I (2018). "Learning with Opponent-Learning Awareness." *International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*.

6. ^a ^b ^c ^d ^e Omohundro SM (2008). "The Basic AI Drives." In *Artificial General Intelligence 2008* (pp. 483–492). Springer.
7. ^a ^b ^c Arthur WB (1994). *Increasing Returns and Path Dependence in the Economy*. University of Michigan Press.
8. ^a ^b ^c Bak P (1996). *How Nature Works: The Science of Self-Organized Criticality*. Springer.
9. [^] Narayanan A, Clark J (2017). "Bitcoin's Academic Pedigree." *Communications of the ACM*. 60(12): 36–45.
10. ^a ^b David PA (1985). "Clio and the Economics of QWERTY." *American Economic Review*. 75(2): 332–337.
11. ^a ^b Kuhn TS (1962). *The Structure of Scientific Revolutions*. University of Chicago Press.
12. [^] Camazine S, et al. (2003). *Self-Organization in Biological Systems*. Princeton University Press.
13. [^] Wilson KG (1979). "Problems in Physics with Many Scales of Length." *Scientific American*. 241(2): 158–179.
14. [^] Gould SJ (2002). *The Structure of Evolutionary Theory*. Harvard University Press.
15. [^] Schelling TC (1960). *The Strategy of Conflict*. Harvard University Press.
16. [^] Von Neumann J, Morgenstern O (1944). *Theory of Games and Economic Behavior*. Princeton University Press.
17. ^a ^b Barabási A-L (2002). *Linked: The New Science of Networks*. Basic Books.
18. [^] Gabriel I (2020). "Artificial Intelligence, Values, and Alignment." *Minds and Machines*. 30: 411–437.

Declarations

Funding: No specific funding was received for this work.

Potential competing interests: No potential competing interests to declare.