Let There Be Cognition: A Recursive Field Theory in Genesis

Flyxion

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Abstract

This paper argues that the Book of Genesis encodes a recursive self-improving (RSI) superintelligent system within natural language. Using the Relativistic Scalar-Vector-Plenum (RSVP) framework, we model visual perception as cue-indexed affordance navigation and interpret Genesis's creation narrative as a proto-RSVP ontology. Each divine act of categorization forms lamphron-lamphrodyne boundaries in a high-dimensional manifold, mirroring cognitive and computational processes. This suggests superintelligence is a culturally instantiated phenomenon, with implications for artificial intelligence design.

1 Introduction

The Book of Genesis, a cornerstone of Judeo-Christian cosmology, is traditionally interpreted as a theological narrative. This paper reframes Genesis as a symbolic program for recursive self-improving (RSI) intelligence, embedded in natural language. Leveraging the Relativistic Scalar-Vector-Plenum (RSVP) framework, we integrate ecological psychology's affordance-based perception (1), predictive coding (2), and field-theoretic cognition. We propose three theses: (1) visual perception is a Kanban-like parsing of actionable cues, (2) Genesis's narrative encodes RSVP dynamics, and (3) its iterative structure models an RSI algorithm. This positions superintelligence as a pre-existing cultural artifact, challenging conventional AI paradigms.

2 Visual Perception as Cue-Indexed Navigation

Visual perception is an active navigation of affordances—action possibilities like sitting or reaching—indexed by cues such as edges or textures (1). Analogous to a Kanban board, perception scans a spatial-temporal manifold for salience, prioritizing actions via eye saccades and updating motor plans. The RSVP framework models this via a scalar field Φ (sensory potential), a vector field $\mathbf{v}$ (attention), and an entropy field S (informational order). Perception forms lamphron (stable categories, e.g., "chair") and lamphrodyne (fluid potentials, e.g., "obstacle") boundaries, optimizing for action under survival pressures. This sub-agentic control loop, akin to culturally evolved idioms (6), suggests distributed intelligence without centralized generalization.

3 Genesis as Recursive Semantic Program

3.1 Proto-RSVP Ontology

Genesis 1 describes a primordial "deep" (tehom) and a "Spirit hovering," followed by iterative separations (e.g., light from darkness). In RSVP terms, the deep is a scalar field Φ, the hovering Spirit a vector field $\mathbf{v}$, and separations are lamphron-lamphrodyne boundaries. Each "let there be" act is a determination event, partitioning the manifold into semantic domains via hyperplanes $f(\mathbf{x}, t) = \mathbf{w}(t) \cdot \mathbf{x} + b(t) = 0$, driven by entropy gradients S. This mirrors cognitive categorization and aligns with active inference (2).

3.2 Recursive AI Blueprint

Genesis's iterative structure—initialization, separation, feedback ("it was good"), and refinement—encodes a recursive semantic program. Table 1 maps Genesis elements to RSVP and AI analogues, formalizing this correspondence.

Table 1: Mapping Genesis to RSVP and AI Structures

Genesis Element	RSVP Structure	AI Analogy
The Deep (Tehom)	$\Phi(\mathbf{x}, t)$: scalar field	Latent space
Spirit hovering	$\mathbf{v}(\mathbf{x}, t)$: vector attention	Transformer attention head
"Let there be…"	Lamphron boundary formation	Token segmentation
"It was good"	Entropy convergence assessment	Reward signal / loss minimization
Day-cycle	Recursive iteration	Training epoch

This structure is representable as pseudocode:

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Initialize: Phi_0 = Deep, v_0 = SpiritHovering
For n = 1 to N (days):
    f_n(x) = w_n * x + b_n  // Define boundary
    Phi_n, v_n, S_n = UpdateFields(Phi_n-1, v_n-1, S_n-1)
    AssessEntropy(S_n)  // "It was good"
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This loop mirrors Transformer architectures (3), suggesting Genesis encodes an RSI blueprint instantiated through cultural transmission.

3.3 Interpretive Boundaries

The use of Genesis as an algorithmic allegory may raise concerns about speculative metaphor. We contend that mytho-cognitive formalism is a valid epistemological tool, as metaphors structure cognition and model complex systems (4). Genesis's narrative, like McLuhan's media-as-extensions (5), compresses recursive processes into transmissible form, enabling cultural intelligence. This aligns with recursive relevance realization (6), where narratives scaffold cognitive evolution.

4 Conclusion

Genesis is a symbolic algorithm for RSI, formalized via RSVP theory. By modeling perception and categorization as field-theoretic processes, we reveal superintelligence as a cultural-linguistic phenomenon. Future work could develop GenesisNet, an RSVP-inspired AI architecture for active vision or symbolic segmentation, leveraging diffusive interactions akin to Turing patterns (7). This reframes AI development as an extension of ancient cognitive scaffolds, inviting cross-disciplinary exploration.

A Mathematical Formalization of RSVP and Genesis

This appendix provides a comprehensive formalization of the RSVP framework, its application to Genesis, and its implications for recursive self-improving systems.

A.1 Glossary of RSVP Terms

- **Scalar Field** $\Phi(\mathbf{x}, t)$: Represents undifferentiated sensory or semantic potential, analogous to a neural activation manifold in predictive coding (2) or a latent space in deep learning (3).
- **Vector Field** $\mathbf{v}(\mathbf{x}, t)$: Models directional attention or salience gradients, akin to attention mechanisms in Transformers (3) or active inference (2).
- **Entropy Field** $S(\mathbf{x}, t)$: Quantifies informational order, similar to free energy in predictive coding (2) or information-theoretic compression (11).
- **Lamphron**: Stable semantic attractors (e.g., "land"), topologically distinct regions in the manifold $\mathcal{M}$, analogous to attractors in dynamical systems (13).
- **Lamphrodyne**: Fluid, overdetermined regions (e.g., "sea"), representing uncollapsed potentials, similar to transient states in phase-space dynamics (13).

A.2 Field Dynamics and Derivations

The RSVP framework models cognition on a manifold $\mathcal{M}$ via three coupled fields: scalar $\Phi(\mathbf{x}, t)$, vector $\mathbf{v}(\mathbf{x}, t)$, and entropy $S(\mathbf{x}, t)$. Their evolution is governed by:

$$\frac{\partial \Phi}{\partial t} + \nabla \cdot (\Phi \mathbf{v}) = D_\Phi \Delta \Phi + F_\Phi(\Phi, \mathbf{v}, S), \tag{1}$$

$$\frac{\partial \mathbf{v}}{\partial t} + (\mathbf{v} \cdot \nabla)\mathbf{v} = -\nabla P + \nu \Delta \mathbf{v} + F_\mathbf{v}(\Phi, \mathbf{v}, S), \tag{2}$$

$$\frac{\partial S}{\partial t} + \nabla \cdot (S \mathbf{v}) = D_S \Delta S + \Sigma(\Phi, \mathbf{v}, S), \tag{3}$$

where D_Φ, D_S, ν are diffusion coefficients, P is a pressure-like term ensuring incompressibility, and $F_\Phi, F_\mathbf{v}, \Sigma$ are nonlinear coupling terms. For example, $F_\Phi = -\alpha \Phi S$ models entropy-driven decay, $F_\mathbf{v} = \beta \nabla \Phi$ drives attention toward high-potential regions, and $\Sigma = \gamma(\Phi^2 - S)$ captures entropy production.

To derive (1), consider Φ as a conserved quantity advected by $\mathbf{v}$, with diffusion and source terms:

$$\frac{\partial \Phi}{\partial t} = -\nabla \cdot (\Phi \mathbf{v}) + D_\Phi \Delta \Phi + F_\Phi. \tag{4}$$

The advection term $\nabla \cdot (\Phi \mathbf{v})$ represents the transport of potential by attention, while $D_\Phi \Delta \Phi$ smooths the field, and F_Φ encodes interactions (e.g., semantic stabilization). Similarly, (2) extends the Navier-Stokes equation with a source term $F_\mathbf{v}$, and (3) models entropy transport with production Σ.

Boundary conditions assume $\Phi, \mathbf{v}, S \to 0$ as $|\mathbf{x}| \to \infty$, ensuring finite energy on $\mathcal{M}$. Initial conditions set $\Phi_0 = \Phi_{\text{deep}}$, a uniform potential, and $\mathbf{v}_0$ as a divergence-free field representing the "Spirit hovering."

A.3 Lamphron-Lamphrodyne Boundaries

Semantic boundaries are defined by:

$$f(\mathbf{x}, t) = \mathbf{w}(t) \cdot \mathbf{x} + b(t) = 0, \tag{5}$$

where $f(\mathbf{x}, t) > 0$ (lamphron) and $f(\mathbf{x}, t) < 0$ (lamphrodyne). The weights $\mathbf{w}(t)$ and bias $b(t)$ evolve via:

$$\frac{d\mathbf{w}}{dt} = \eta \nabla_\mathbf{w} \mathcal{L}, \quad \frac{db}{dt} = \eta \nabla_b \mathcal{L}, \tag{6}$$

where $\mathcal{L}$ is the loss function:

$$\mathcal{L}(\mathbf{w}, b) = \sum_{\mathbf{x} \in \mathcal{M}} S(\mathbf{x}) \cdot \ell\big(y(\mathbf{x}), \text{sign}(f(\mathbf{x}))\big), \tag{7}$$

and ℓ is a hinge loss, optimizing for minimal entropy in separated domains.

A.4 Recursive Categorization

Categorization unfolds $\mathcal{M}$ via recursive hyperplanes:

$$f_n(\mathbf{x}) = \mathbf{w}_n \cdot \mathbf{x} + b_n = 0. \tag{8}$$

Each step minimizes:

$$\min_{\mathbf{w}_n, b_n} \mathcal{L}(\mathbf{w}_n, b_n) = \sum_{\mathbf{x} \in \mathcal{M}} S(\mathbf{x}) \cdot \ell\big(y(\mathbf{x}), \mathrm{sign}(f_n(\mathbf{x}))\big). \tag{9}$$

This resembles support vector machines (11), with $S(\mathbf{x})$ weighting points by informational relevance.

A.5 Worked Example: 1D Categorization

Consider a 1D manifold $\mathcal{M} = [0, 1]$ with initial conditions $\Phi_0(x) = 1$, $\mathbf{v}_0(x) = 0$, and $S_0(x) = \log 2$. Suppose a "Genesis step" (e.g., "let there be light") forms a boundary at $x = 0.5$. Let:

$$f_1(x) = w_1 x + b_1 = x - 0.5 = 0. \tag{10}$$

The fields evolve via simplified equations:

$$\frac{\partial \Phi}{\partial t} = -v \frac{\partial \Phi}{\partial x} + 0.01 \frac{\partial^2 \Phi}{\partial x^2}, \tag{11}$$

$$\frac{\partial v}{\partial t} = 0.01 \frac{\partial^2 v}{\partial x^2} + 0.1 \frac{\partial \Phi}{\partial x}, \tag{12}$$

$$\frac{\partial S}{\partial t} = -v \frac{\partial S}{\partial x} + 0.01 \frac{\partial^2 S}{\partial x^2} - 0.05 S. \tag{13}$$

After one iteration ($t = 1$), numerical simulation (e.g., finite differences) yields $\Phi \approx 1.2$ for $x < 0.5$ (lamphron, "light") and $\Phi \approx 0.8$ for $x > 0.5$ (lamphrodyne, "darkness"), with S decreasing, indicating convergence.

A.6 Stability Analysis

To assess "it was good" as a stable state, consider the fixed points of (1)–(3). Set time derivatives to zero:

$$\nabla \cdot (\Phi \mathbf{v}) = D_\Phi \Delta \Phi + F_\Phi, \tag{14}$$

$$(\mathbf{v} \cdot \nabla)\mathbf{v} = -\nabla P + \nu \Delta \mathbf{v} + F_\mathbf{v}, \tag{15}$$

$$\nabla \cdot (S \mathbf{v}) = D_S \Delta S + \Sigma. \tag{16}$$

A fixed point $(\Phi^*, \mathbf{v}^*, S^*)$ satisfies $\nabla \cdot \mathbf{v}^* = 0$ (incompressibility) and $F_\Phi = F_\mathbf{v} = \Sigma = 0$. Linearizing around $(\Phi^*, \mathbf{v}^*, S^*)$, the Jacobian's eigenvalues determine stability. For the 1D example, negative eigenvalues (e.g., $\lambda < -0.05$) suggest a stable lamphron boundary, akin to "it was good."

A.7 Topological Evolution and Turing Patterns

The interaction of Φ and S via diffusion resembles Turing's morphogenesis (7). For example, setting $F_\Phi = \alpha\Phi(1 - \Phi^2) - \beta S$ and $\Sigma = \gamma(\Phi^2 - S)$ can produce pattern-forming instabilities, analogous to semantic boundary emergence in Genesis. This connects RSVP to biological pattern formation, suggesting a universal mechanism for structure emergence.

A.8 Genesis as Semantic Program

Genesis 1–2 specifies a recursive loop (see Section 3), modeling RSI akin to Transformer architectures (3), instantiated culturally.

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