

# INFINITE SELF

## A FIELD GUIDE TO NESTED WORLDS

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A world can appear inexhaustible without storing an inexhaustible world. This field guide accompanies an interactive browser experiment: a finite window into a procedurally indexed, many-scaled visual field.

The question is not whether a graphic has a soul. The question is what changes in our interpretation when we change scale, starting conditions, and attention.

## What you can do

Explore with wheel, pinch, drag, or keyboard. Zoom through layers of local motifs. Save up to eight session bookmarks. Compare two seeded previews using shared rules. Generate a shareable URL encoding seed, coordinates, and scale. Export a still PNG. Turn down motion or use Focus mode.

Important: the browser has a bounded magnification range; the canvas represents no physical dimension. This is a creative instrument, not a psychometric, ecological, or consciousness measurement.

# 01 / The technical instrument

## Deterministic cell identities

At each integer layer  $L$ , cells are indexed by integer  $(i, j)$ . A 32-bit integer-mixing function combines the seed text,  $i$ ,  $j$  and  $L$ . The hash selects one of several graphic families, its accent colour, rotation, relative size and whether the cell has a visible motif. Thus the same seed + address + layer yields the same motif without saving a database of cells.

## Continuous zoom, discrete structure

The camera uses a continuous logarithmic depth  $d$  with magnification  $2^d$ . Cell spacing at layer  $L$  follows  $2^{-L}$ . As  $d$  changes, a small set of nearby layers is visible. Shapes therefore form a sequence of different nested-scale neighbourhoods. Moving between levels changes which motifs become legible, but it does not reproduce the strict geometry of a classical self-similar fractal.

## Finite work, potentially vast addresses

Only cells intersecting the viewport are considered. The renderer caps work per frame, skips tiny and very large layer footprints, reduces sampling density when necessary and limits pixel resolution on high-density screens. No child graph is recursively allocated. This is an explicit design choice: the illusion of boundlessness should not require unbounded RAM.

## What the artwork does not do

It does not use an AI API, track visitors, use biological observations, mathematically prove emergence, or simulate sentience. Names like “polyp,” “species” and “ecosystem” are fictional taxonomies for visual patterns. The title “Self” is a poetic invitation, not a claim about identity theory.

## 02 / Three guided experiments

### Experiment A — Repetition is not identity

1. Start at seed MONFOX, centre (0,0), magnification 1x. Make a sketch or jot down two features. 2. Use the Scale Map to visit strata 3, 6 and 9. 3. Save a bookmark at each stop. 4. Return to the first view and distinguish recurring visual grammar (rings, radial symmetry, branching) from uniquely located motifs.

Question: What made the layers feel related? Did the formal rules or the content repeat? Why can one describe a structure as “recursive-looking” without claiming it is a mathematical fractal?

### Experiment B — Counterfactual seeds

1. Open the side-by-side comparison. Set A and B to the same seed: their static previews should match. 2. Change B to a different seed. 3. Keep camera and renderer fixed. 4. Name at least three differences in position, colour, motif or density.

Question: What survives changes in initial conditions? Here the code is invariant, while the outcomes vary. This is an analogy for rule-based generative systems, not a proof that human personalities follow such a rule.

### Experiment C — The observer matters

1. Pause animation, set intensity to 0 and disable annotations. Observe one neighbourhood for 30 seconds. 2. Turn annotations back on. 3. Enable Focus mode. 4. Turn the interface back on.

Question: When does a label help observation? When does it produce a story about a shape that was not in the evidence?

## 03 / Interpretation and limits

### Recursion, self-similarity, emergence: related but distinct

Recursion describes a process or definition referring to smaller versions of itself. Self-similarity describes resemblance across scales, and can be exact, statistical or approximate. Emergence is a disputed, context-dependent idea often used when collective-level patterns arise from interacting components. This piece implements procedural repetition across scales, rather than a cellular automaton with interacting agents. It therefore illustrates some ingredients of complexity, but not a scientific demonstration of strong emergence.

### Why the seed test is epistemically useful

If two views differ, the seed is one controlled difference. If they match with identical inputs, the local indexing scheme is reproducible. This is a small example of manipulating a variable while holding code and camera constant. There is no random sampling, hypothesis test, or causal inference about a natural phenomenon.

### Metaphor versus empirical claim

Artistic metaphor: nested environments invite reflection on multiple contexts in a human life. Empirical claim: using deterministic integer functions produces repeatable visible choices for the same input in a fixed implementation. Not claimed: that a mind literally contains fractal inhabitants; that scales of identity are algorithmically enumerable; that complex graphics are conscious.

### Interface constraints

Zoom range is clamped (approximately 0.5x to 4,000x). At extreme offsets, floating-point or integer mixing can alias; camera positions are bounded when imported from a URL. The program uses finite grids, sampling and painterly composition, not infinite numerical precision. Device performance, typeface rasterisation and browser canvas implementation may cause small visual differences. Animation uses elapsed time and is intentionally excluded from static compare previews.

## 04 / Field recording worksheet

Use these fields for one careful observation. The point is not to record the most impressive image; it is to record what you can actually defend.

**SEED**

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**COORDINATES**

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**DEPTH / STRATUM**

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**MOTION / ANNOTATIONS**

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**WHAT I SAW**

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**WHAT I INFERRED**

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**ALTERNATIVE READING**

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**WHAT WOULD CHANGE MY MIND?**

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## 05 / Suggested further reading

Benoit B. Mandelbrot, *The Fractal Geometry of Nature* (1982). Historical and mathematical framing for fractals and self-similarity.

John H. Holland, *Emergence: From Chaos to Order* (1998). An accessible account of rules, interactions and system-level patterns.

Melanie Mitchell, *Complexity: A Guided Tour* (2009). A careful introduction to computation, emergence and complexity.

Douglas Hofstadter, *Gödel, Escher, Bach: An Eternal Golden Braid* (1979). Recursive structures as intellectual and artistic motifs; philosophical arguments should not be treated as settled science.

Craig Reynolds, “Flocks, Herds, and Schools: A Distributed Behavioral Model” (SIGGRAPH, 1987). A classic example of agents with local interactions producing flock-like group patterns. Unlike this artwork, boids update interdependent positions.

WCAG 2.2, W3C Recommendation (2023). Accessibility principles for perceivability, keyboard operation, reduced motion and contrast.

## A reflection to carry away

A larger view can erase detail. A closer view can erase context. Which scale has most influenced the stories you tell about yourself? What evidence would a different scale add?

Explore the interactive work: <https://infiniteself.sahiltayal.online/>

Canonical creative universe: <https://sahiltayal.com/>

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Creative project author: Sahil Tayal. Original explanatory writing and artwork prepared for Sahilverse. No unsupported academic or scientific credentials are asserted.