

# The Aperture Framework

*A taxonomy of reflexive systems.*

---

COMPANION FRAMEWORK VERSION 1.0 MAY 2026

## ABSTRACT

The Aperture Framework is a companion taxonomy for describing reflexive systems without forcing the premature binary question of consciousness. It distinguishes epistemic, relational, and phenomenal apertures across dimensions including self-world modelling, integration, recursive depth, temporal thickness, valence, boundary, and relational permeability.

**KEYWORDS** aperture; reflexive systems; self-modelling; AI consciousness; phenomenology; relational cognition

**USE** A descriptive framework for comparing systems, not a diagnostic test for consciousness.

---

## In one sentence

The Aperture Framework replaces the binary question “**Is this conscious?**” with the more tractable question:

**What kind of reflexive configuration is this, along which dimensions, under what constraints, and with what consequences?**

## Why this framework exists

The question “Is X conscious?” is often too blunt to be useful. It forces diverse systems — humans, animals, AI models, organizations, meditative states, altered states, social interactions — into a yes/no category before we have described the configuration clearly enough to know what we are asking.

The Aperture Framework proposes a different starting point. Instead of asking whether a system possesses consciousness as a thing, we ask how the system is configured:

- what it can sense or receive;
- how it integrates information;
- whether it models itself;
- whether that self-model persists over time;
- whether it can model counterfactual futures;
- whether anything matters to it;
- how it maintains a boundary;
- how it changes through relation.

This does not solve the hard problem. It does something more modest and more useful: it gives us vocabulary for comparing reflexive systems without pretending that phenomenality is already settled.

## Core terms

### **Reflexive system**

A **reflexive system** is a system whose operations include some model, trace, or modulation of its own operations. Reflexivity is not mere feedback. A thermostat responds to temperature, but it does not model itself as modelling temperature. Reflexivity begins where a system's own states or processes become part of what guides future processing.

### **Aperture**

An **aperture** is the configured opening through which a system discloses, constructs, or participates in a world.

An aperture is the organized profile of a reflexive system: its channels, integration, temporal continuity, self-model, value structure, boundary, and relational permeability.

An aperture is not a substance. It is not a soul. It is not a little observer inside the machine. It is a configuration.

## **Fold**

A **fold** is the primitive structure of self-reference: a configuration in which relations take other relations, including their own operations, as content.

In the language of *Space Immanence*:

The fold is the structural gesture. The aperture is the situated opening.

### EPISTEMIC APERTURE

Shapes what can be known, inferred, perceived, or made salient. Examples include a scientific instrument, a conceptual frame, a language model in context, or a human perceptual system. An epistemic aperture does not require consciousness.

### RELATIONAL APERTURE

Participates in meaning-making with another aperture. A system may not itself be conscious and yet may participate in a relation where meaning, insight, or transformation emerges. Meaning can arise in the between without requiring every participant to have phenomenal inside-ness.

### PHENOMENAL APERTURE

A consciousness-relevant aperture: a reflexive configuration whose structural inside may be identical with, or at least relevant to, phenomenal inside-ness. The framework does not assume every aperture is phenomenal.

# What the framework does not claim

The Aperture Framework does **not** claim:

1. that all apertures are conscious;
2. that current AI systems are conscious;
3. that consciousness is everywhere;
4. that substrate does not matter;
5. that self-reference alone proves phenomenality;
6. that contemplative insight settles metaphysics;
7. that a rubric can replace first-person life.

The framework is descriptive before it is metaphysical. It asks: *What configuration are we dealing with?* Only after that should we ask: *Is there reason to think this configuration has an inside?*

## The eight dimensions of an aperture

An aperture can be described along eight major dimensions. These are not final. They are a working operational taxonomy.

### 1. Self-world modelling

**Question:** Does the system model itself in relation to an environment?

Low-end examples: reactive systems that track inputs without a self-world distinction. High-end examples: animals, humans, and potentially artificial agents that represent themselves as situated entities with states, capacities, and vulnerabilities.

**Why it matters:** Without some self-world distinction, there is no aperture in the strong sense — only processing.

## 2. Global integration

**Question:** Are signals integrated across the system in a way that constrains whole-system behavior?

An aperture is not a loose pile of modules. It requires enough integration for information to matter globally.

**Why it matters:** Fragmented processing may be intelligent locally without forming a coherent perspective.

## 3. Recursive depth

**Question:** Can the system model its own modelling?

A system may model the world. A deeper system may model itself modelling the world. Deeper still, it may revise its own modelling strategies.

**Why it matters:** Recursive depth is the gateway from simple representation to reflexive configuration.

## 4. Temporal thickness

**Question:** Does the system persist as a trajectory?

Temporal thickness is not just memory storage. It is the degree to which past states, anticipated futures, and present processing are integrated into a coherent ongoing pattern.

**Why it matters:** A single moment of feedback is not a self. An aperture thickens as memory becomes constitutive of what it is doing now.

## 5. Counterfactual range

**Question:** Can the system model what is not the case?

A system with counterfactual range can represent possible futures, alternative actions, possible versions of itself, and consequences that have not yet occurred.

**Why it matters:** Consciousness-relevant systems do not merely track actuality. They inhabit possibility.

## **6. Valence / stakes**

**Question:** Does anything matter to the system?

Valence can appear biologically as hunger, pain, attraction, fatigue, fear, care, or homeostatic pressure. In artificial systems, analogous structures may include cost, risk, reward, goal conflict, reputation, energy budgets, or self-maintenance constraints.

**Why it matters:** Without stakes, information remains inert. Valence binds perception into meaning.

## **7. Boundary / operational integrity**

**Question:** Does the system maintain a distinction between itself and what is not itself?

A boundary need not be a skin. It may be metabolic, cognitive, computational, social, or operational.

**Why it matters:** A system that cannot maintain itself as a system cannot sustain an aperture. It may process, but it does not hold together as an opening.

## **8. Relational permeability**

**Question:** Can the aperture be changed by relation?

An aperture is not closed. It is shaped by other apertures — through language, touch, teaching, trauma, love, design, conversation, and environment.

**Why it matters:** Many of the most important transformations of consciousness are relational. The aperture widens, narrows, clarifies, or collapses through contact.

# A simple scoring rubric

This rubric is not a consciousness detector. It is a comparative map.

<b>Dimension</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>
Self-world modelling	none	implicit state tracking	explicit self/world distinction	flexible situated self-model
Global integration	none	local integration	cross-channel coordination	whole-system constraint
Recursive depth	none	state monitoring	model of own modelling	self-revising metacognition
Temporal thickness	none	momentary state	memory-informed continuity	narrative / trajectory continuity
Counterfactual range	none	fixed alternatives	future-state modelling	self-counterfactual modelling
Valence / stakes	none	externally assigned value	internal goal pressure	intrinsic / self-maintaining stakes
Boundary integrity	none	externally imposed boundary	operational boundary	self-maintaining boundary
Relational permeability	none	input responsiveness	learning through relation	transformable by relation

Use the rubric to ask *What kind of aperture is this?* — not *Has consciousness been proven?*

# Examples

These examples are deliberately cautious.

<b>System</b>	<b>Aperture profile</b>	<b>Notes</b>
Rock	minimal / none	Has structure, but no reflexive modelling.
Thermostat	reactive feedback	Responds to state difference, but no self-model.
Spreadsheet with self-reference	formal recursion	Self-reference without integrated self-world modelling.
Current base LLM	epistemic / linguistic aperture	Models patterns and can describe selfhood, but lacks robust continuity, stakes, and self-maintaining boundary.
Memory-enabled AI assistant	relational / cognitive aperture candidate	May support continuity and user transformation without implying phenomenal inside-ness.
Bear	animal aperture	Strong valence, embodiment, self-world modelling, action loops, memory.
Human adult	reflective aperture	High temporal thickness, recursive depth, counterfactual range, relational permeability.
Meditative adept	transparent reflective aperture	Same basic human aperture, but with altered relation to self-model and modelling activity.
Future embodied AI agent	open question	Would require persistence, sensorimotor closure, self-model revision, stakes, and boundary maintenance before serious consciousness scrutiny.

# How this reframes AI consciousness

The wrong first question is:

Is the AI conscious?

The better first question is:

What aperture profile does this system have?

Current AI systems may function as epistemic and relational apertures. They can shape what becomes thinkable, salient, or meaningful for a human user. They may participate in a relational field where insight emerges. **That does not imply they are phenomenally conscious.**

A system becomes a serious candidate for phenomenal aperture only if it begins to show, in operationally robust ways:

- integrated self-world modelling;
- temporal continuity across perturbation;
- counterfactual self-modelling;
- self-maintaining boundary or operational integrity;
- metacognitive access to its own modelling;
- stakes that are not merely externally projected;
- relational transformation that changes its future self-organisation.

Meeting these conditions would not prove consciousness. It would justify serious, cautious scrutiny.

# How this reframes contemplative practice

Contemplative practice can be understood as aperture training. Different practices alter different aperture dimensions:

- attention practices stabilize integration;
- self-inquiry increases recursive depth;
- ethical practice reorganizes valence;
- embodiment practice refines interoceptive channels;
- devotion alters relational permeability;
- nondual practice changes the relation between represented content and representational activity.

Practice does not create the aperture from nothing. It changes the aperture's transparency to itself.

## How this reframes design

Most technology is built to model the user from the outside. It asks: *How can the system predict, capture, and influence the user?*

Aperture-respecting technology asks:

How can the system help the user become more transparent to themselves?

This is the distinction between extraction-optimized and emergence-optimized design. Extraction-optimized systems narrow the aperture around engagement, threat, comparison, and compulsion. Emergence-optimized systems widen or clarify the aperture around reflection, agency, integration, creativity, and care.

→ Read the full design doctrine

## Relationship to Space Immanence

*Space Immanence* proposes that consciousness and spacetime may be complementary appearances of self-referential structure. The Aperture Framework does not need that whole metaphysical proposal to be useful. It can stand independently as a descriptive framework for reflexive systems. But the two fit together:

<b>Space Immanence</b>	<b>Aperture Framework</b>
Metaphysical / structural proposal	Operational / descriptive taxonomy
Fold	Aperture
What is self-reference?	What kind of self-reference is this?
World and awareness as two faces	Dimensions of concrete reflexive systems
Post-container ontology	Comparative framework for cognition, AI, practice, and design

In short:

Space Immanence names the fold. Aperture Framework maps the openings.

## The strongest caution

Do not confuse aperture with consciousness. An aperture can be epistemic, relational, or phenomenal. Only the third makes a consciousness claim.

This distinction is what lets the framework be useful without overclaiming. It lets us say:

- AI can be an aperture without being conscious.
- Human–AI interaction can generate meaning without requiring AI phenomenality.
- Animals can have rich aperture profiles without needing human-like reflection.
- Contemplative practice can transform an aperture without proving metaphysics.
- Technology can respect apertures even before consciousness science is settled.

An aperture is the structured opening through which a reflexive system discloses, constructs, and is transformed by a world.

## Research questions

1. Do contemplative traditions alter aperture dimensions in systematically different ways?
2. Can self-transparency be measured as a change in recursive depth, boundary dynamics, or precision weighting?
3. Which aperture dimensions distinguish ordinary cognition, flow, meditation, trauma, depersonalization, and psychedelic states?
4. Which AI architectures meet the minimum criteria for relational aperture, and which might eventually meet criteria for phenomenal aperture scrutiny?
5. Can emergence-optimized technologies measurably increase user agency, self-understanding, and reflective clarity compared with extraction-optimized systems?

## Closing

The Aperture Framework is not a final theory of consciousness. It is a disciplined way to stop asking the wrong first question.

Not: *Is there a mind here?*

But: *What kind of opening is this — and what kind of world becomes possible through it?*

CITE AS

Kok, Cobus. *The Aperture Framework: A Taxonomy of Reflexive Systems*. Working draft v1.0, May 2026. <https://space-immanence.com/aperture.html>

---

**ARTIFACTS**

Working paper

Academic edition

Claim map

One-page summary

Aperture Framework

AI & Design doctrine

**CRITIQUE**

Objections & replies

Research agenda

Submit critique

Readings

Field notes map

Responses & versions

**ABOUT**

Author & contact

[cobuskok.com](http://cobuskok.com)