

REALITY GLITCH

A FIELD GUIDE TO IMPOSSIBLE PERCEPTION

Six playable optical chambers, three guided inquiries, and a language for separating sensory evidence from interpretation.

Creative project author: Sahil Tayal

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realityglitch.sahiltayal.online

Use alongside the interactive museum or independently. This is an educational art publication, not a diagnostic instrument.

01 / Seeing is an informed guess

Vision does not deliver a complete 3D model of the world. Light hits photoreceptors; subsequent neural processing uses contrasts, motion, boundaries, context and learned regularities to estimate what might have caused those signals. The word “inference” is an explanatory framework for this process, not a statement that we consciously reason through every frame.

Ambiguous visual patterns are unusually useful: one set of marks can support several plausible interpretations. When an interpretation switches while the drawing stays constant, it exposes the difference between a stimulus and its perceptual organisation.

Evidence versus metaphor. Context effects, ambiguous figures and perspective cues are studied empirical phenomena. Calling them “reality glitches” is artistic language. They do not show that physical reality is unreal, nor that personal impressions are necessarily accurate.

02 / Six chambers, six mechanisms

01 Ambiguous rotation

Symmetry and weak depth cues make screen motion compatible with more than one mental 3D construction. The museum animates overlapping ellipses; its sign and speed are controlled by the visitor.

Try: Slow the pattern. Pause it. Describe exactly what moves on the screen before naming a 3D direction.

02 Reversible room

A set of convergent edges supplies perspective information but does not uniquely determine the shape or camera position of a room. Shifting a vanishing point changes the relative geometry.

Try: Move the vanishing point across the display. Which faces appear closer? Which only change in your description?

03 Corridor of almost-infinity

Repeated nested outlines imply diminishing apparent size and enclosure. In everyday scenes, such relations often accompany increasing distance. Here they arise from flat drawn polygons.

Try: Change corridor skew. Track one line with a finger. Notice how little information is needed to suggest a tunnel.

04 Colour is relational

A central square of RGB #aa83c7 appears in two contexts. Surround luminance and chromatic contrast can shift apparent colour, even though the central values are mathematically equal.

Try: Cover the backgrounds with paper, leaving only the two centres visible. Compare their appearance again.

05 Parallax theatre

Nearby surfaces typically shift across the retina faster than faraway ones as an observer moves. The museum fakes this motion disparity by moving flat 2D layers at different rates.

Try: Reduce the offset, then exaggerate it. Describe when you start assigning depth and when the effect feels artificial.

06 Impossible staircase

Some impossible figures are constructed from segments that appear plausible separately but cannot be embedded together consistently in ordinary Euclidean 3D space. This is a stylised loop with an intentionally inconsistent connection.

Try: Locate a corner where the join looks acceptable. Follow the loop. Where does your single 3D explanation become inconsistent?

03 / Guided inquiries

Inquiry A — Keep the pixels still. Choose chamber 01. Adjust speed, pause and use the before/after control. Record two sentences: one about observable line motion and one about the inferred physical object. Repeat after revealing the drawing mechanism. What changed in your certainty?

Inquiry B — Change only the neighbour. In chamber 04, set contrast to 0, 50 and 100. The centres remain #aa83c7 throughout. Record their apparent similarity or difference and consider display calibration, surrounding light and colour-vision variation as alternative explanations for the strength of the effect.

Inquiry C — Build an impossible place. In chambers 02, 03 and 06, manipulate one parameter at a time. Sketch or describe a scene that would explain the local edges. Then ask whether your description remains consistent across the entire image. It need not.

04 / Observation sheet

Which chamber and setting?

What do the pixels / shapes objectively show?

What object or event did I perceive?

Which cues encouraged that interpretation?

What alternate interpretation could fit?

What changed after revealing the mechanism?

05 / Reflection and caution

Perception is generally reliable enough to support action in a world with regularities; optical illusions are demonstrations of constraints and trade-offs, not evidence that the senses are useless. An inference-driven model is powerful because it permits correction: competing hypotheses can be tested against additional cues.

The museum is neither a clinical screening tool nor a controlled laboratory experiment. Apparent strength will differ across devices and people. Avoid prolonged viewing if it causes strain or dizziness. All animation is user-triggered, non-strobing, and subject to reduced-motion settings. Use the focus and pause controls as needed.

06 / Further reading

- Richard L. Gregory, *Eye and Brain: The Psychology of Seeing* (various editions). Classic introduction to visual inference and illusion.
- E. H. Gombrich, *Art and Illusion* (1960). How image-making and interpretation depend on conventions and expectations.
- Donald D. Hoffman, *Visual Intelligence* (1998). An influential account of visual construction; philosophical claims remain debatable.
- David Marr, *Vision* (1982). Computational levels of analysis in vision science.
- Adelson, E. H. (1995), "Checker-shadow illusion." A well-known educational demonstration of lightness constancy.
- Purves, D., Lotto, R. B. (2003), *Why We See What We Do*. Perceptual organisation and visual context.

The short explanations above are original pedagogical summaries, not endorsements by the cited authors. Several models of perception coexist and differ in their mechanisms and explanatory scope.

07 / A question to carry away

When you disagree with an image, ask what it actually supplies and what your mind has reasonably added. That distinction matters not only for optical art but also, by analogy, for reading evidence, interpreting messages and revising first impressions. The social analogy is a reflective metaphor, not a controlled consequence of the illusion.

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