

The Drift Principle: When Compression Outruns Fidelity

Cognitive Drift Series – CD 2.1

A. Jacobs — Reality Drift Framework (2023–2026)

Core Claim

Cognitive Drift emerges when compression increases faster than fidelity can be maintained, producing coherent representations that no longer align with underlying reality.

This relation introduces a structural limit: as systems scale through increasing compression, semantic fidelity does not scale at the same rate, making drift an expected outcome rather than an anomaly.

Mechanism

- Systems compress reality into simplified representations
- Fidelity constrains alignment between representation and reality
- Compression scales through optimization, abstraction, and repetition
- Fidelity does not scale at the same rate
- Representations remain coherent while losing grounding
- Drift accumulates as misalignment increases

Key Concepts

- **Compression:** Reduction of complexity into efficient representations
- **Semantic Fidelity:** Alignment between representation and underlying reality as meaning is compressed and transformed
- **Drift Principle:** Instability when compression exceeds fidelity
- **Cognitive Drift:** Subjective and structural effects of degraded fidelity
- **Synthetic Realness:** Coherent outputs detached from lived reality

How Drift Emerges

Cognition can be understood as a process in which reality is compressed into representations.

When fidelity is maintained, these representations remain aligned with underlying reality, producing coherent meaning. As compression continues to scale, however, fidelity begins to lag.

This growing imbalance leads to misalignment between representation and reality, which accumulates over time as drift, eventually producing instability even as the system continues to generate coherent outputs.

Equation

Drift = Entropy ÷ Compression

- Entropy reflects environmental complexity and instability
- Compression reflects the system's capacity to model and reduce that complexity
- When entropy exceeds compression capacity, drift emerges

From the system's perspective, this appears as $\text{Drift} \approx \text{Compression} \div \text{Fidelity}$, where drift increases when compression outpaces fidelity, decreases as fidelity improves, and leads to unstable meaning when the imbalance grows.

Observable Effects

When compressed systems continue operating without sufficient fidelity, meaning begins to feel thin despite maintaining a coherent structure.

Time perception becomes compressed and unstable, identity fragments or becomes increasingly mediated by external systems, and information requires constant filtering.

Over time, communication itself loses shared grounding, as representations remain internally consistent while drifting further from underlying reality.

Drivers of Drift

Compression Loops

- Information is repeatedly compressed and recirculated
- No new grounding is introduced

Mirror Effects

- Systems reflect representations back to users
- Distortion accumulates through optimization

Adaptive Responses

Drift (Default)

- Fragmentation
- Overload
- Loss of coherence

Co-Cognition (Conditional)

- Recursive human–machine feedback
- Stabilization through bounded loops

Synthetic Flow (Subset)

- Sustained recursive stabilization
- Meaning concentration instead of degradation

Reality Drift Framework Connection

The Drift Principle describes the underlying mechanism of Reality Drift: systems remain operational and coherent while gradually losing alignment with reality as environmental complexity exceeds their capacity to compress and stabilize information.

As this imbalance persists, representations continue to function and appear coherent, even as their connection to underlying reality weakens and drift becomes the default condition.

Keywords: *cognitive drift, compression, fidelity, semantic drift, synthetic realness, information overload*

Related Concepts: *semantic fidelity, recursive compression, synthetic flow, mirror effect, cognitive architectures*

Source: *Integrated into the Reality Drift Framework, this work draws from the Cognitive Drift Archive (2024–2025).*