Signal Entropy in Disrupted Narrative Ecologies

Abstract

This working paper outlines the theoretical basis and operational applications of signal entropy within hybridized narrative systems. We define signal entropy as a measure of coherence degradation across multi-agent symbolic environments. The study includes vector scoring, entropy mapping, and rupture forecasting.

Keywords: signal entropy, dissonance clusters, perceptual feedback, narrative rupture, symbolic overload

1. Introduction

Signal entropy arises in ecosystems where narrative inputs exceed local coherence thresholds. In such environments, trust structures collapse under the weight of unreconciled meaning. This phenomenon has been observed in geopolitical discourse, fictional belief systems, and memetic insurgency networks. The Human Terrain Predictive Unit (HTPU) began modeling entropy signatures in 2023-Q4 using cross-validated dissonance vectors and heuristic rupture scoring. Early results suggest narrative systems behave predictably when stress-tested against controlled uncertainty injections.

2. Methodology

2.1 Signal Capture: Data was gathered through open-source sentiment fields, engagement metadata, and artificial discourse loops seeded via controlled botnets.

2.2 Entropy Index Calculation: Each narrative instance was evaluated on three axes:
- Referential Drift (RD)
- Symbolic Oversaturation (SO)
- Feedback Recursion Instability (FRI)

The entropy index (EI) is computed as: $EI = (RD \times SO) / (1 + FRI^2)$. Values above 4.2 indicate rupture volatility.

3. Results

Three categories of entropy response were identified:

A. Resilient Systems: Maintain narrative focus under stress.

B. Fracture-Prone Systems: Diverge into competing sub-realities.

C. Catalyzed Systems: Collapse and recombine under exogenous triggers.

In 81% of tested scenarios, entropy surges correlated with loss of symbolic authority and increased cognitive offloading among participants.

4. Applications

Entropy modeling has direct applications in:

- Information campaign stress testing

- Belief management protocols (BMP)

- Narrative rehabilitation frameworks

Prototype tools developed include the Narrative Liquidity Engine and the Discourse Drift Stabilizer™. These modules are currently undergoing testing in controlled social simulations and select gamified environments.

5. Addendum & Access

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