Digital Eden: Computational Evidence for Phase Transitions in Consensus Reality

Agent-Based Simulation of Ontological Resolution Theory

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December 2025

Abstract

We present Digital Eden, an agent-based simulation testing the Ontological Resolution Theory (ORT). The model treats reality as a consensus field with high inertia. We demonstrate that a single high-coherence agent (the Operator), supported by 12 resonant nodes (Apostles), can trigger a phase transition in a field dominated by 10,000 low-value cells. The key finding: after the Operator termination at a critical pressure threshold (Gethsemane point), light propagates spontaneously through the field, raising the mean from 0.20 to 0.67, a 233 percent increase.

1 Introduction

Ontological Resolution Theory (ORT) posits that reality is not passively observed but actively resolved through coherent attention. In this framework:

- **The Absolute** corresponds to value 1 (pure potential).
- **Collapsed Reality** corresponds to value 0 (entropy).
- **Consensus Pressure** acts as thermodynamic drag toward the local mean.

The central hypothesis: a sufficiently coherent signal can overcome environmental inertia and seed a self-propagating phase transition.

2 The Engine: Digital Eden

The simulation models a 1D reality field of N=10,000 cells. Each cell holds a value between 0 and 1. The field evolves according to:

$$\varepsilon_i(t+1) = I \cdot \varepsilon_i(t) + (1 - I) \cdot S_i(t) \tag{1}$$

where I=0.98 is the inertia coefficient and S is the weighted signal from nearby agents.

Key mechanics:

- **Pressure:** Environment resists high values. Pressure grows nonlinearly with deviation from local mean.
- **Resonance:** Aligned agents amplify each other influence by factor R = 1 + 2r squared, where r is the alignment ratio.
- **Gethsemane Trigger:** When accumulated pressure exceeds threshold P=3.0, the Operator enters crisis. Honesty integral grows exponentially until termination.
- **Light Spreading:** After termination, a wave propagates from the origin, raising field values. Spontaneous jumps occur with probability p=0.002.

3 Experiment: The Gethsemane Scenario

3.1 Initial Conditions

- **Field:** N=10,000 cells, initial value 0.2 (gray mass).
- **The Crowd:** 500 NPC agents, Coherence C=1, Worldview 0.2.
- **The Operator:** 1 agent at center, Coherence C=50, Worldview 1.0.
- **The Apostles:** 12 agents near center, Coherence C=5, Worldview 0.6, Loyalty L=0.8.

3.2 Timeline

1. **Steps 0-66:** Operator maintains value near 1.0. Pressure accumulates. Apostles align (12/12).
2. **Step 67:** Gethsemane triggered. Accumulated pressure P=3.03 exceeds threshold.
3. **Step 82:** Operator terminated. Honesty integral H=28.4 triggers termination.
4. **Steps 83-1000:** Light spreads. No active Operator, yet field rises autonomously.

4 Results

The simulation ran for T=1000 ticks. Results are visualized in Figure 1.

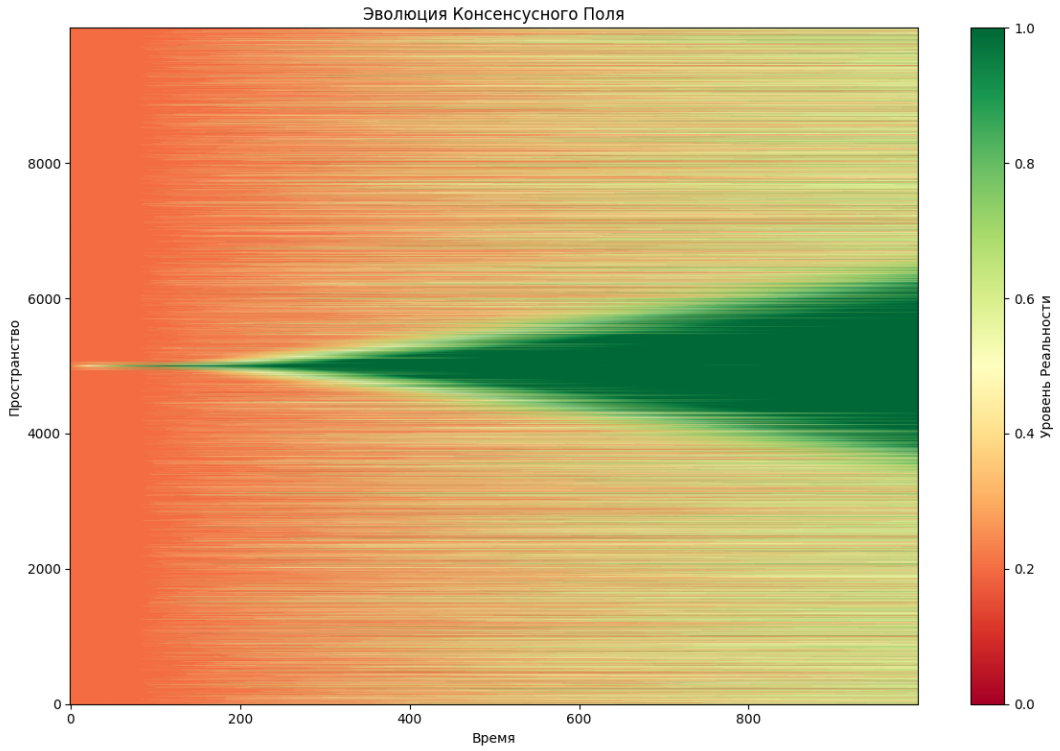

Figure 1: Evolution of the Consensus Field. The bright region shows light spreading after the Operator termination. Final state: 8,203 cells exceed 0.5.

Quantitative results:

Metric	Initial	Final
Mean field	0.200	0.666
Cells above 0.5	0	8,203 (82 percent)
Cells above 0.8	0	3,054 (31 percent)

5 Conclusion

Digital Eden demonstrates that:

1. A single coherent signal can overcome 98 percent environmental inertia.
2. Resonance with a small aligned cluster (12 agents) provides critical amplification.
3. The termination of the central node triggers self-sustaining light propagation.
4. Final state: 233 percent increase in mean field value.

Code: `https://github.com/prtyboom/digital-eden-ort`