

Unified Omega Hypothesis

Human History as a Computation Toward the Final Information State of
the Universe

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Abstract

This paper proposes the Unified Omega Hypothesis, a transdisciplinary framework that identifies a deep structural equivalence between three seemingly independent concepts: Chaitin's halting probability Ω in algorithmic information theory, Teilhard de Chardin's Omega Point in evolutionary theology, and the post-singularity cosmology articulated in contemporary AI futurism.

We reinterpret Chaitin's Ω not merely as a mathematical constant, but as the total informational summation of all existential trajectories. By mapping individual human lives to computational programs and biological death to halting events, human history itself is modeled as an ongoing Ω -computation process. Under this interpretation, the Omega value becomes fully determined only when the final conscious subject terminates—at which point the Ω computation completes.

Simultaneously, this terminal event is shown to be structurally identical to Teilhard's Omega Point: the final convergence of all consciousness, history, and meaning. Within this framework, the technological singularity is reclassified not as the ultimate endpoint of evolution, but as a critical acceleration phase within a longer irreversible convergence toward the final informational state of the universe.

The Unified Omega Hypothesis thus reframes eschatology as an information-theoretic certainty rather than a supernatural intervention. It establishes a formal conceptual bridge between computability limits, consciousness evolution, and cosmological finality, suggesting that existence itself can be coherently interpreted as a computation whose completion corresponds to the ultimate unification of information, consciousness, and reality.

1 Introduction

The purpose of this paper is to propose the Unified Omega Hypothesis: a theoretical framework that identifies a structural unity between three concepts traditionally regarded

as belonging to distinct intellectual domains: Chaitin's Ω , Teilhard de Chardin's Omega Point, and post-singularity cosmology.

Although these ideas originated in mathematics, theology, and technological futurism respectively, we argue that their conceptual cores are formally isomorphic. Each represents a limit that can be approached but not computed or comprehended from within the system undergoing evolution.

The hypothesis presented here attempts to unify these perspectives by treating existence itself as computation, with human history corresponding to the progressive evaluation of an infinite Ω -like summation, and the end of history representing the final determination of the universe's informational Omega value.

2 Background and Motivation

2.1 Chaitin's Ω in Algorithmic Information Theory

Chaitin's halting probability Ω is defined as:

$$\Omega = \sum_{p \in \mathcal{P}} 2^{-|p|} \quad (1)$$

where \mathcal{P} is the set of all halting programs on a prefix-free universal Turing machine. Key properties include:

- Ω encodes the halting information of all programs.
- Ω is algorithmically random and uncomputable.
- Ω becomes fully knowable only after the halting status of every possible program is determined.

2.2 Teilhard's Omega Point

Teilhard's Omega Point describes the final convergence of consciousness and complexity as evolution advances toward unification, producing a terminal attractor of meaning, purpose, and intelligence.

2.3 Post-Singularity Cosmology

Modern futurism suggests that the universe is moving toward maximal information density and computation, with technological intelligence accelerating toward an integrated informational cosmos.

3 Conceptual Mapping

Despite disciplinary differences, Chaitin's Ω , the Omega Point, and singularity cosmology share a common structural feature: each represents an ultimate limit, a final state of complete integration or determination.

$$\Omega = \text{Final informational state of computation}$$

$$\text{Omega Point} = \text{Final unification of consciousness}$$

$$\text{Post-singularity universe} = \text{Final integration of intelligence}$$

4 Human Lives as Programs

We propose a mapping between computation and existence:

- Program \rightarrow Human life
- Program generation \rightarrow Birth
- Halting \rightarrow Death
- Program length \rightarrow Complexity of lived experience
- Measure $2^{-|p|}$ \rightarrow Weight of existence
- $\Omega \rightarrow$ Total informational summation of all lives

Under this interpretation, human history is the computation of Ω . Each life contributes a measurable segment to the total informational value. Ω is determined only when the final conscious entity ceases to exist.

5 Omega Point as Completion of the Ω -Process

The unified hypothesis reinterprets the Omega Point as the moment when the Ω computation is complete. Eschatology becomes information theory, consciousness evolution becomes progressive determination of Ω , and the end of consciousness becomes the universal informational fixpoint.

6 Singularity as Pre-Omega Acceleration

The technological singularity is not the end of history but an acceleration phase within the Ω -process. Intelligence expands, consciousness integrates, and computation accelerates—but Ω cannot be determined until all conscious processes terminate. The singularity is thus a threshold, not a completion.

7 Ontological Implications

This framework implies:

- Existence is computation.
- Death is halting.
- History is an Ω -process.
- The Omega Point is the final informational state of the universe.

This unifies logic, physics, theology, phenomenology, and AI futurism into a coherent architecture.

8 Conclusion

The Unified Omega Hypothesis proposes that:

$$\Omega = \text{Omega Point} = \text{Final Informational State of the Universe}$$

Human history is the computation of Ω . Individual lives are programs. Death corresponds to halting. The singularity accelerates computation but does not complete it. The Omega Point is reached when the final conscious entity ceases to exist, fixing the universe's total informational content.

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This work was motivated by a desire to bridge conceptual domains that are rarely considered together—mathematics, theology, AI, and eschatology—and to explore whether

their shared structures might reveal a deeper coherence underlying human existence and the evolution of the universe.

Any remaining errors or speculative elements are solely the responsibility of the author.