Derivation of the Consistency Metric ($\mathcal{C}$)

The Perpetual Consistency Framework (PCF)

Abstract

The Perpetual Consistency Framework proposes that the foundational drive of the universe is the continuous, active maintenance of **Consistency** across all scales. The Consistency Metric ($\mathcal{C}$) is a dimensionless number that quantifies the universal state's proximity to the ideal state of probabilistic consistency, unifying entropic loss with the geometric structure of spacetime.

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1 Defining Probabilistic Variance ($\mathcal{V}$)

Probabilistic Variance ($\mathcal{V}$) is the universal measure of uncertainty and potential entropy. It is fundamentally tied to the information contained within the total wave function of the universe, Ψ. The primary goal is to minimize this variance.

$$\mathcal{V} \equiv \sum_i \left(P_i - \frac{1}{N} \right)^2 \tag{1}$$

Where:

- P_i is the probability of outcome i.
- N is the total number of possible quantum states available to the system.

2 The Consistency Metric ($\mathcal{C}$)

The Consistency Metric ($\mathcal{C}$) is defined as the inverse relationship to the square of the maximum possible variance, normalized by a scaling factor (k):

$$\mathcal{C} \equiv 1 - k \cdot \mathcal{V} \tag{2}$$

The mandate of the universe, as theorized by the PCF, is the continuous, active attempt to enforce $\mathcal{C} \to 1$.

2.1 Key Properties of $\mathcal{C}$

- $\mathcal{C} \to 1$ **(High Consistency):** Corresponds to a state of minimal probabilistic variance, typically achieved by deterministic, consistent interactions (e.g., wave function collapse).
- $\mathcal{C} \to 0$ **(Low Consistency):** Corresponds to a state of maximal entropy and uncertainty.
- **Dimensionality:** $\mathcal{C}$ is fundamentally dimensionless, allowing it to govern physics across all scales without conflict.

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