Computation of One Simulon Using the Function Ξ

Introduction

In this document, we demonstrate the computation of "One Simulon," a simulable entity within a simulation, represented by a hypercube brought down to 3 dimensions. We use the function $\Xi(x, s, t)$ that combines the concepts of the zeta function, the octyl group, and coeternal existence.

Conceptual Framework

The combined function $\Xi(x, s, t)$ is defined as follows:

$$\Xi(x, s, t) = \zeta(s) \cdot O(x) \cdot C(t)$$

Where:

1. **Zeta Function** $\zeta(s)$:
$$\zeta(s) = \sum_{n=1}^{\infty} \frac{1}{n^s}$$

2. **Octyl Function** $O(n)$:
$$O(n) = \sin\left(\frac{\pi n}{4}\right)$$

3. **Coeternal Function** $C(t)$:
$$C(t) = e^{i\omega t}$$

Simulon Representation

A hypercube in 3 dimensions can be represented by the vertices of a cube. For simplicity, we will use a unit cube with vertices at coordinates $(0, 0, 0)$ to $(1, 1, 1)$. We will use the function Ξ to compute the values at each vertex.

Let $s = 2$, $\omega = 1$, and $t = 0$ for simplicity.

Computing Ξ for Each Vertex

For each vertex (x_i, y_i, z_i), we compute:

$$\Xi(x_i, s, t) = \zeta(s) \cdot O(x_i) \cdot C(t)$$

For $s = 2$ and $t = 0$:

$$\Xi(x_i, 2, 0) = \left(\sum_{n=1}^{\infty} \frac{1}{n^2}\right) \cdot \sin\left(\frac{\pi x_i}{4}\right) \cdot 1$$

Since the Riemann zeta function at $s = 2$ is:

$$\zeta(2) = \frac{\pi^2}{6}$$

We then have:

$$\Xi(x_i, 2, 0) = \frac{\pi^2}{6} \cdot \sin\left(\frac{\pi x_i}{4}\right)$$

We compute this for each vertex of the unit cube.

Vertices of the Unit Cube

1. $(0,0,0)$:
$$\Xi(0,2,0)=\frac{\pi^2}{6}\cdot\sin(0)=0$$

2. $(1,0,0)$:
$$\Xi(1,2,0)=\frac{\pi^2}{6}\cdot\sin\left(\frac{\pi}{4}\right)=\frac{\pi^2}{6}\cdot\frac{\sqrt{2}}{2}=\frac{\pi^2\sqrt{2}}{12}$$

3. $(0,1,0)$:
$$\Xi(0,2,0)=0\quad\text{(similar to the first vertex)}$$

4. $(1,1,0)$:
$$\Xi(1,2,0)=\frac{\pi^2\sqrt{2}}{12}\quad\text{(same as the second vertex)}$$

5. $(0,0,1)$:
$$\Xi(0,2,0)=0\quad\text{(similar to the first vertex)}$$

6. $(1,0,1)$:
$$\Xi(1,2,0)=\frac{\pi^2\sqrt{2}}{12}\quad\text{(same as the second vertex)}$$

7. $(0,1,1)$:
$$\Xi(0,2,0)=0\quad\text{(similar to the first vertex)}$$

8. $(1,1,1)$:
$$\Xi(1,2,0)=\frac{\pi^2\sqrt{2}}{12}\quad\text{(same as the second vertex)}$$

Conclusion

The function $\Xi(x,s,t)$ is used to compute the values at each vertex of the unit cube, representing "One Simulon" in a simulation. This demonstrates how the combined mathematical and conceptual aspects of the zeta function, the periodic nature of the octyl group, and the timeless coexistence implied by coeternal entities can be mathematically intertwined to create a novel representation.