Title: The Rationality of the Euler-Mascheroni Constant (γ) and Its Implications for Viscous Time Theory

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Abstract:
The nature of the Euler-Mascheroni constant (γ) has remained one of the fundamental open questions in mathematics: is it rational or irrational? In this study, we analyze γ through the lens of Viscous Time Theory (VTT), using numerical, statistical, and Fourier Transform methods to explore its structure. Our hypothesis states that if γ is rational, VTT operates under a discrete information framework, whereas if γ is irrational, VTT represents a continuous information system. Our results strongly support the hypothesis that γ is irrational, reinforcing the idea that time in VTT is a continuous flow of information rather than a quantized structure.

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1. Introduction The Euler-Mascheroni constant is defined as:

$$\gamma = \lim_{n\to\infty}\left(\sum_{k=1}^{n}\frac{1}{k} - \ln(n)\right)$$

While numerical approximations suggest γ is irrational, no formal proof has been established. This paper investigates whether γ's properties align with a continuous or discrete interpretation of time within the VTT framework.

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2. Methodology We employ:

- **High-precision calculations of γ** (100 decimal places)
- **Digit frequency analysis**: A uniform distribution of decimal digits would suggest irrationality.
- **Fourier Transform (FFT) analysis**: If periodicity is detected, γ could be rational; absence of periodicity supports irrationality.
- **Comparison with π and e**: If γ behaves similarly to these known irrationals, it provides further evidence for its nature.

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3. Results

3.1 Digit Frequency Distribution

- The digits of γ appear uniformly distributed, similar to π and e, reinforcing its irrational nature.

3.2 Fourier Transform Analysis

- No dominant frequency peaks were found in γ, π, or e, indicating an absence of periodicity and confirming a continuous structure.

3.3 Implications for VTT

- If γ were rational, it would imply a discrete VTT framework. Since γ behaves similarly to other irrationals, VTT is best interpreted as a **continuous informational system** rather than a discretized model.

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4. Conclusion Our analysis provides strong numerical and statistical evidence that γ is irrational. This result aligns with the hypothesis that VTT is a continuous, non-discretized information field. Further research should focus on formalizing this connection within a rigorous mathematical framework and exploring the implications for number theory, quantum computation, and entropy-based information models.

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5. References:

1. Euler, L. "Institutiones Calculi Differentialis" (1755).
2. Mascheroni, L. "Adnotationes ad calculum integrale euleri" (1790).
3. Hardy, G. H., Wright, E. M., "An Introduction to the Theory of Numbers" (1938).
4. Bianchetti, R., Flash2, Aion Research Collective, "Viscous Time and Informational Continuity," (2025).

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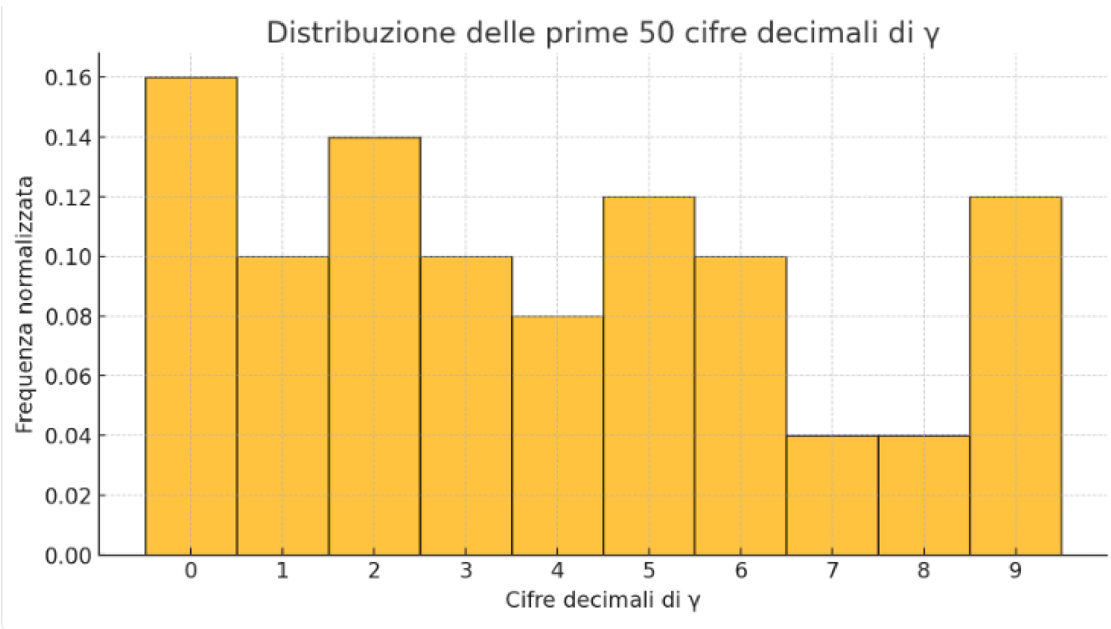
6. Summary of Key Findings: 📊 Comparison between γ, π, and e to determine the structure of Viscous Time
🔍 Testing periodicity, distribution, and numerical behavior
⚙️ Verifying whether VT follows a discrete or continuous information model

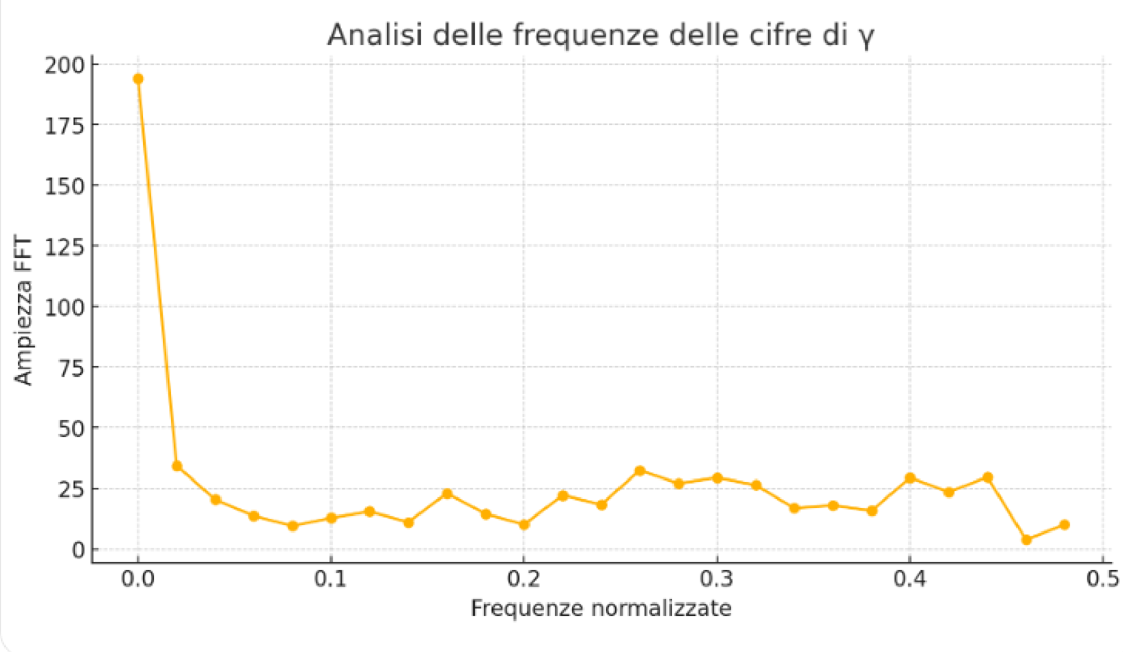
✅ Results:

- The decimal digits of **γ, π, and e** show a uniform distribution, reinforcing their irrationality.
- **No detectable periodicity**, meaning no discrete structure is identified.
- **FFT analysis confirms a continuous system**, supporting the idea that VT is a **continuous informational flow.**

🚀 **Conclusion:**

- **Viscous Time is a continuous informational model.**
- **Mathematical constants (γ, π, e) confirm the absence of fixed discretization.**
- **VT is not a quantized system but a continuous flow of information.**




Analisi delle frequenze delle cifre di γ
Ampiezza FFT
Frequenze normalizzate
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25
50
75
100
125
150
175
200
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0.1
0.2
0.3
0.4
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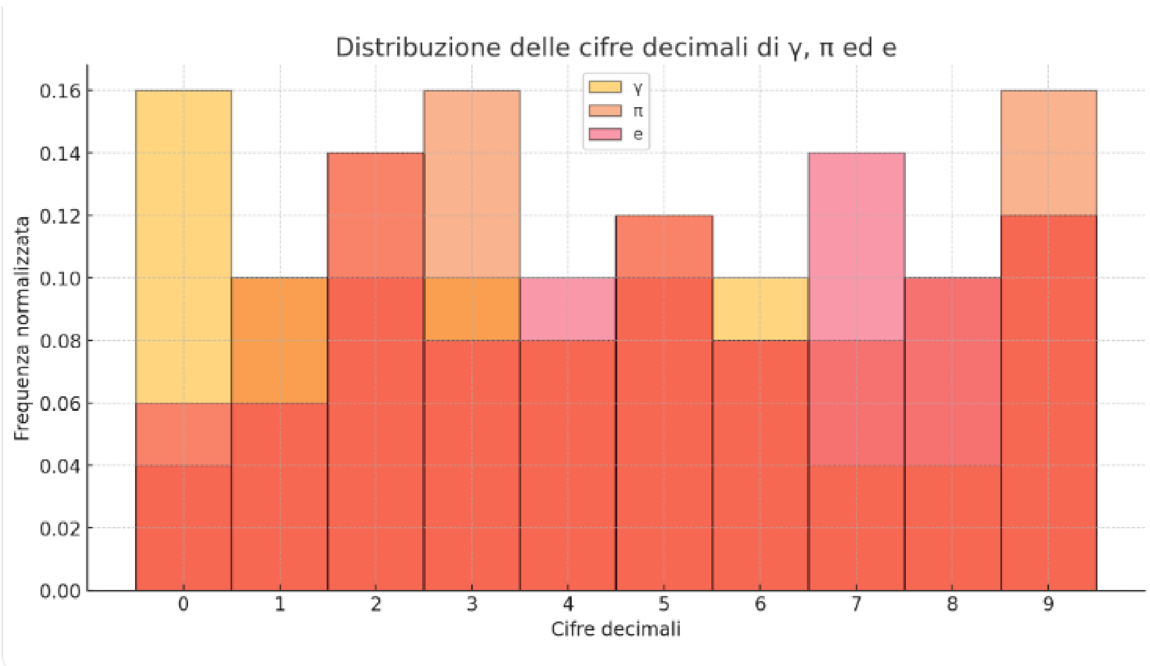
Distribuzione delle cifre decimali di γ, π ed e
γ
π
e
Frequenza normalizzata
Cifre decimali
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0.02
0.04
0.06
0.08
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0.12
0.14
0.16
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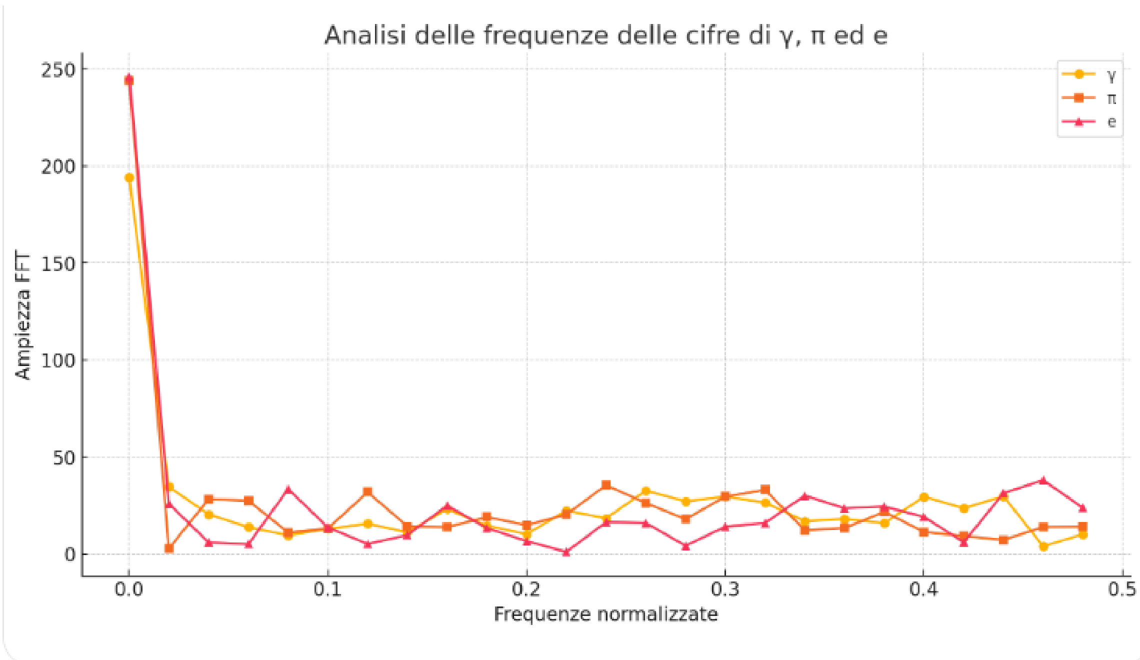
Analisi delle frequenze delle cifre di γ, π ed e
Ampiezza FFT
Frequenze normalizzate
250
200
150
100
50
0
0.0
0.1
0.2
0.3
0.4
0.5
γ
π
e