Title of Invention:

Proof-of-Persistence (PoP) Distributed Consensus Protocol Using Complex-Valued Fractal Resonance Units and Anisotropic Reaction-Diffusion Routing

Inventor: Oleksiy Babanskyy

Viale verdi 51, Modena, 41121,Italy

Cross-Reference: Priority to anisotropic conductance provisional (2025).

Detailed Description:

A blockchain consensus protocol (Mycelial Consensus – Proof-of-Persistence) where:

1. Blocks are Fractal Resonance Units (FRUs) with Hurst-derived persistence p_i
2. Fork choice via continuous Hopfield attractor settling on persistence-weighted energy landscape
3. Propagation via anisotropic FitzHugh-Nagumo with conductance diode $\sigma(\gamma (p_i - p_j))$, $\gamma \geq 300$
4. Persistence from thermodynamic coin-age: $H = \tanh(\beta \log(1 + \Sigma \text{ coin}\cdot\text{seconds}))$
5. Multi-Guardian Byzantine tolerance >70%, O(log N) routing

Claims:

1. A decentralized consensus protocol wherein blocks are complex-valued FRUs and chain selection uses persistence-weighted Hopfield dynamics (Proof-of-Persistence).
2. The protocol of claim 1 using anisotropic reaction-diffusion routing with $\gamma \geq 300$.
3. The protocol of claim 1 with thermodynamic Hurst from coin-age accumulation. 4–30: multi-Guardian, Ghost Weight, eUTxO compatibility, etc.

Abstract:

Mycelial Consensus – the first Proof-of-Persistence blockchain solving the trilemma via ontological gravity and fractal attractor dynamics.