Mathematical Framework of the Stonian Clonal Root System Algorithmic Paradigm (SPNF)

Executive Summary

The SPNF framework models a computational system after clonal root organisms. Multiple independent computational trunks share a unified purpose: long-term stability. The framework prioritizes resilience, regeneration, and adaptation over raw performance.

1. System Overview

The system consists of multiple computational trunks at time t. Each trunk has a performance value that changes over time. The number of trunks is represented as n(t). The total system capability is the sum of all trunk performances at time t, called H(t). The system aims to match a target capability level known as H-star. If the current capability falls below the target, the difference is called the homeostatic error.

2. Key Mathematical Concepts in Words

Each trunk contributes a performance value that changes with time depending on resources and effectiveness. The total capability H(t) is the sum of all active trunk contributions. The target capability H-star is the desired performance level. The homeostatic error measures how far the system is from its target and determines the system's response.

3. RETP Priority-Based Allocation

Each trunk has a priority that determines its importance. Resource allocation is based on trunk performance, system deficit, and task priority. Higher priority trunks receive more resources. Weaker trunks are supported when the system underperforms. RETP constraints ensure resource use remains efficient and sustainable.

4. QCAD Compensation Dynamics

QCAD introduces a balancing force. If total capability is below the target, a positive compensatory force increases support to remaining trunks. If capability exceeds the target, the compensatory force becomes negative, slowing growth. This enables self-correction and prevents unnecessary resource usage.

5. Structural Plasticity

The system can remove failing trunks and add new ones. If a trunk's performance drops below a minimum threshold, it is removed. If the system underperforms and resources are available, a new trunk is created. New trunks start with low capability and grow over time.

6. Algorithm Summary

Measure current capability H(t). Compute the difference from the target capability. Assign resources based on priority and performance. Activate QCAD compensation to adjust trunk performance. Remove failing trunks. Create new trunks if system capability remains low. Repeat this cycle to maintain stability and regeneration.