

# From Interruption to Construction: Divergent Operational Paths Toward Mathematical Stabilization

## A dynamic program for operational mathematics under interruption and uncertainty

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March 2, 2026

**Status:** exploratory mathematical program — evolving draft.

This text proposes an operational entry point into mathematics based not on convergence, axiomatic closure, or fixed formal systems, but on *interruptible divergence*.

Rather than seeking stable limits as primary objects, we investigate divergent dynamical constructions that can be locally interrupted, restarted, and partially stabilized. In this perspective, classical theories of convergence appear as contextual sub-theories, emerging locally within broader non-convergent dynamics.

Mathematical structures are not assumed to exist beforehand. They arise as transient or persistent stabilizations inside evolving interaction systems.

A *garden* is an evolving dynamical landscape formed by interconnected lianes, where transformations propagate, bifurcate, interfere, and sometimes locally stabilize.

Solutions, invariants, and structures are interpreted as regions of relative persistence inside these landscapes, rather than as absolute objects.

Understanding a mathematical object becomes equivalent to learning how to navigate its garden: how to propagate locally, how to detect partial stabilization, how to manage divergence, and how to trigger new explorations when uncertainty remains too high.

## 1 Motifs, directional partitions, and operational divergence

The elementary operational units are *motifs*: small local patterns of directed actions, interruptions, and couplings. Motifs compose into dynamic assemblies whose global behavior is primarily divergent.

Rather than forcing convergence, these assemblies generate structured instabilities, whose directional partitions create multiple complementary operational perspectives.

Multiplication generates a global dynamical structure — a liane — whose four directional partitions  $(q, d, p, b)$  induce distinct modes of exploration. Addition emerges as a directional projection of this multiplicative dynamics, not as an independent primitive.

Binary sequences such as  $|+ - - + - -|$  encode local navigational traces inside these divergent flows, where the symbols  $+$  and  $-$  represent oriented oscillations rather than algebraic signs.

Exponentiation emerges as an iterative vertical propagation across hierarchical layers of the liane. This process does not aim at global convergence, but at the production of nested zones of relative stability.

Arithmetic constructions therefore operate under permanent interruption, partial observation, and incomplete synchronization. Numerical values appear only as locally stabilized summaries of divergent trajectories.

## 2 From operational divergence to mathematical problems

The objective of this framework is not to reproduce existing mathematics, but to reconstruct its structural core from dynamic operational processes.

By rebuilding arithmetic, geometry, and combinatorics from interruptible divergent dynamics, we seek alternative decompositions and invariants that remain invisible in standard formalizations.

Classical convergent theories are recovered as special cases, corresponding to local stabilization regimes within broader non-convergent flows.

This viewpoint opens new entry points into relaxed formulations of number-theoretic and combinatorial problems, where solutions are seen as islands of coherence inside vast dynamic landscapes.

## 3 Binary sections and counterbalanced divergence

We introduce binary sections of the form  $|w||w'|$ , where  $w, w'$  are words over  $\{+, -\}$  whose lengths differ by at most one.

These sections do not encode numbers directly. They represent dynamically balanced histories, where divergence is locally constrained by counterweight mechanisms.

A numerical value arises only as a secondary effect, measuring a persistent asymmetry inside an otherwise divergent dynamic.

## 4 Central uncertainty and adaptive divergence

In this framework, uncertainty is not a defect to be eliminated, but the primary engine of construction.

At any stage, the current degree of stabilization determines whether further exploratory rounds are required. Computation therefore unfolds as an adaptive divergent process: stabilization is always provisional, and may be deliberately abandoned to open new dynamical paths.

Estimators act as *certification traits*: local stabilizing structures built on top of divergent traces. These traits can themselves be destabilized, recomposed, or refined, forming stratified towers of dynamic encodings — *gardens over gardens*.

The four directional threads  $(q, d, p, b)$  organize this divergence geometrically. Each thread probes a distinct dimension of uncertainty, creating chains of encodings whose form depends on the dynamics of exploration itself.

In this sense, representation is intrinsically dynamical: encoding and verification co-evolve. Certainty appears only as a temporary regime inside an otherwise divergent process.

## 5 Complexity, verification, and fissurability

Rather than viewing complexity as a static measure of computational cost, we interpret it as a dynamic capacity for controlled fissuration: the ability to fragment, explore, and reassemble operational histories under interruption. Decidability corresponds to the stabilization of a central balanced region, while semi-decidability emerges from directional expansions along the boundaries. Verification appears as a localized fault line, mediating between exploration and stabilization.

## Next layers

This document presents the current operational core of a broader mathematical program. Several complementary layers are planned:

- **story:** a narrative reconstruction of the emergence of these ideas, emphasizing intuition, metaphors, and conceptual continuity;
- **readable:** a pedagogical and progressive exposition, aimed at accessibility and concrete examples;
- **operational models:** explicit constructions, diagrams, and worked arithmetic instances.