UNNS Tetrad Operators:
Expanded Reference Guide

UNNS Research Collective

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Contents

1 Summary Table

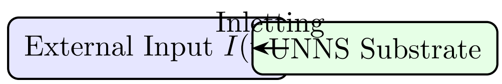
Operator	Definition	Analogy	Applications
Inletting	Injecting external inputs (signals, data, fields) into the UNNS substrate as seeds or forcing terms.	Boundary conditions in PDEs; regulatory signals initiating DNA transcription.	Modeling initial conditions, external forcing in dynamical systems, data-driven seeding of recurrences.
Inlaying	Embedding UNNS sequences into higher-order structures (lattices, meshes, algebraic or topological spaces).	Setting gemstones into jewelry; DNA packed into chromosomes.	Building discrete fields, embedding UNNS into FEEC/DEC meshes, constructing arithmetic lattices.
Repair & Normalization	Stability operations (proofreading, excision, renormalization) that maintain boundedness and coherence of sequences.	DNA repair mechanisms: mismatch correction, excision repair, rescaling by global fitness.	Ensuring numerical stability, error control in recursive algorithms, conservation in discrete physics models.
Trans–Sentifying	Mapping UNNS invariants into perceptual or symbolic domains (images, sounds, language).	Retina: photons $\rightarrow$ vision; cochlea: sound $\rightarrow$ hearing.	Data visualization, sonification of recursions, symbolic export to human/machine interpreters.

2 Inletting

Definition 2.1 (Inletting)**.** Inletting *is the operation that maps external signals into the UNNS substrate, either as initial seeds or as ongoing forcing terms:*

$$I(t) \mapsto \mathcal{U}_0.$$

Example 2.1 (Fibonacci inletting)**.** *Let* $I(t) = \{1, 1\}$*. Inletting initializes the Fibonacci UNNS:* $a_0 = 1, a_1 = 1$*, with recurrence* $a_{n+2} = a_{n+1} + a_n$*.*



Remark 2.1. *Inletting governs the interface between UNNS and the environment. Like initial conditions in PDEs, it determines long-term evolution.*

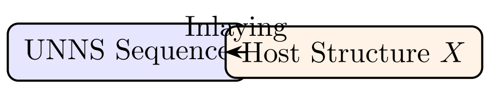
3 Inlaying

Definition 3.1 (Inlaying)**.** Inlaying *embeds UNNS sequences into higher-order structures:*

$$\iota : \{a_n\} \hookrightarrow X,$$

where X *is a lattice, mesh, or algebraic structure.*

Example 3.1 (Gaussian embedding)**.** *Fibonacci residues modulo* 4 *are inlaid into* $\mathbb{Z}[i]$*, creating patterns of Gaussian lattice points.*



4 Repair and Normalization

Definition 4.1 (Repair & normalization)**.** Repair *corrects local inconsistencies, while* normalization *rescales globally to preserve boundedness:*

$$\frac{\max |a_n|}{\min |a_n|} < K,$$

for some constant K*.*

Example 4.1 (Proofreading repair)**.** *If a computed Fibonacci term is corrupted (e.g.* $a_5 = 7$ *instead of* 5*), proofreading compares with the recurrence and corrects the mismatch.*

5 Trans–Sentifying

Definition 5.1 (Trans–sentifying)**.** Trans–sentifying *maps UNNS invariants into perceptual or symbolic spaces:*

$$\mathcal{T} : \mathcal{U} \to \mathcal{S}.$$

Example 5.1 (Audio mapping)**.** *The spectral radius λ of a UNNS companion matrix is mapped to a pitch $f = f_0|\lambda|$, producing a sonification.*