HER2NI-EXPERIMENTAL v0.1

Specification Validation & Falsification Schema

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Abstract

This document defines experimental normative behaviors, falsification criteria, and validation harnesses for HER2NI. It supplements the HER2NI v1.0 protocol without modifying its core semantics. The purpose of this document is to explicitly subject HER2NI coherence metrics, visualizations, and modulation rules to empirical falsification, iteration, and refinement prior to any future normative lock-in. All specifications herein are provisional.

1 Preamble and Relationship to the Core HER2NI Protocol

HER2NI-EXPERIMENTAL v0.1 is a non-normative companion document to the core HER2NI protocol specification:

> *HER2NI: A Protocol for Cross-Substrate Cognitive Alignment, Multimodal Coherence Visualisation, and Multi-User Cognitive-Field Systems*

The core HER2NI protocol defines the *stable, canonical interface* for cross-substrate coherence signalling, including:

- metric interfaces (C_s, S_s, H_s),
- packet schemas and versioning rules,
- extensibility guarantees,
- governance and neutrality principles.

HER2NI-EXPERIMENTAL v0.1 explicitly does **not** modify, reinterpret, or supersede the core HER2NI protocol.

Instead, this document defines a controlled experimental layer whose sole purpose is to:

- test provisional normative behaviors,
- expose assumptions to falsification,
- evaluate validation and calibration strategies,
- identify failure modes prior to standard lock-in.

All mechanisms, thresholds, mappings, and behaviors defined herein are **provisional by design**.

Normative Boundary. Nothing in this document SHALL be considered binding, required, or normative for HER2NI-compliant implementations. Implementations MAY reference this document for research, experimentation, or evaluation purposes only.

2 Experimental Scope and Applicability

HER2NI-EXPERIMENTAL v0.1 applies exclusively to:

- prototype implementations,
- research and laboratory environments,
- evaluation tooling and validation harnesses,
- early deployments under explicitly controlled conditions.

This document intentionally provides **no production guarantees** and introduces **no compliance requirements** for deployed systems.

Any production system claiming HER2NI compatibility MUST rely solely on the core HER2NI protocol specification.

3 Normative Experimental Assumptions

This version tests the following assumptions:

1. Interaction-level coherence can be approximated without inferring internal mental states.
2. Scalar and vector coherence metrics correlate with observable interaction stability.
3. Visual coherence representations improve interpretability without introducing manipulation or coercion.
4. Behaviour modulation based on coherence signals improves stability without degrading task performance.

Each assumption is falsifiable.

4 Falsification Criteria

HER2NI-EXPERIMENTAL v0.1 is considered **invalid** if any of the following conditions are observed:

- H_s fails to correlate with independently measured interaction quality.
- Visualizations consistently mislead users about interaction state.
- AOME modulation degrades outcomes relative to unmodulated baselines.
- Coherence metrics collapse under minor perturbations or noise.
- Different implementations produce incompatible interpretations of the same interaction.

Failure of any criterion triggers revision or abandonment of the affected component.

If repeated empirical evaluation fails to satisfy these criteria, the corresponding metric, visualization, or modulation rule SHALL be considered invalid for normative inclusion, regardless of theoretical appeal.

5 Minimal Falsification Test Harness (v0.1)

Implementations MUST support the following six tests.

5.1 Test 1: Metric Stability

Repeated runs over identical interaction traces MUST produce statistically consistent C_s, S_s, and H_s values within tolerance ϵ.

5.2 Test 2: Perturbation Sensitivity

Small semantic perturbations SHOULD produce proportional changes in drift vectors and H_s, not discontinuous jumps.

5.3 Test 3: Blind Evaluation

Independent evaluators rating interaction quality SHOULD correlate with H_s ordering at a rate exceeding random chance.

5.4 Test 4: Visualization Neutrality

Users MUST NOT, at rates exceeding chance, infer intent, belief, or psychological state from HER visualizations alone when evaluated under controlled conditions.

5.5 Test 5: Modulation Safety

AOME-enabled interactions MUST NOT increase contradiction density or collapse risk relative to control conditions.

5.6 Test 6: Cross-Implementation Consistency

Different implementations MUST agree on qualitative coherence trends even if numeric values differ.

6 Calibration Policy

HER2NI-EXPERIMENTAL permits calibration of:

- weighting parameters,
- drift normalization,
- collapse-risk thresholds,
- visualization mappings.

Calibration MUST:

- be documented,
- be reversible,
- not alter metric semantics.

7 Explicit Non-Claims

This document makes no claims regarding:

- mental state inference,
- emotional diagnosis,
- psychological profiling,
- moral or ethical judgment,
- prediction of human intent.

HER2NI metrics describe *interaction dynamics*, not people.

8 Versioning and Evolution

This document follows experimental versioning:

- v0.x — exploratory and falsifiable,
- v1.x — candidate normative schemas,
- v2.0 — potential incorporation into the core protocol.

Only components that survive falsification MAY advance.

9 Conclusion

HER2NI-EXPERIMENTAL v0.1 provides a controlled environment in which HER2NI assumptions can be tested against reality. It exists to fail fast, surface errors, and prevent premature standardization. The long-term integrity of HER2NI depends on the willingness to discard ideas that do not survive empirical pressure.