

Entropy Signature Trajectory as Machine Input to Deviation Forecasting and Underwriting Disclosure

In U.S. Provisional Application No. 64/117,812, a persistent semantic agent that is architecturally permitted to depart from its own governing policy maintains an ordered, append-only sequence of entropy signatures in its append-only lineage field, one signature recorded upon a deviation. That sequence constitutes a coherence trajectory specific to the agent, and it is not erasable without breaking the continuity of the field. The accumulated entropy signature is available as a machine input to two downstream stages of the same architecture: the forecasting of the deviation likelihood, and the underwriting disclosure comprising the deviation deductible and the aggregate retention apparatus. The trajectory is stated to be an input to both stages and not a record merely readable, and the continuity of the lineage field is a precondition of its availability to each, so that a break in that continuity is detectable as a loss of the trajectory each stage may consume.

1. What a Standing Quantity Does Not Carry

An agent operating under this architecture may depart from the policy governing it. A departure is admitted where the deviation likelihood (706) exceeds unity, and it is recorded as permitted rather than as fault. Every admitted departure carries a quantity

of its own: the entropy-weighted harm coefficient, being the product of a scope coefficient and the dissonance weight of the event, that product multiplied by unity plus a weighted impact sum. The affective, relational, and contextual impacts entering the sum are each recorded at the time of the event and are not recomputed, so a coefficient is fixed at the moment it is formed.

Restoration is asymmetric in the filed disclosure. An act of restoration contributes a positive entropy-scaled increment, scaled by the distribution of the empathy weighting (704) and by policy alignment, and its entropy signature is not required to equal that of the deviation it addresses, a deviation executed within one interval being capable of requiring restoration accumulated across many.

Two later stages of the same architecture draw on entropy material: the forecasting of the deviation likelihood (706), and the underwriting disclosure comprising the deviation deductible and the aggregate retention (800) apparatus. Paragraph [0503] makes available to those stages an ordered sequence of signatures carried in the agent's own append-only field.

2. An Ordered Sequence and Its Two Consumers

The persistent semantic agent (100) maintains an ordered, append-only sequence of entropy signatures in the append-only lineage field (104), each signature recorded upon a deviation. That sequence constitutes a coherence trajectory specific to the agent, and it is not erasable without breaking the continuity of the field. The lineage field is defined in the filing as a structure to which entries are appended and from which entries are neither removed nor modified.

A deviation, in the filed sense, is the admission of a mutation that the signed policy object (112) in force otherwise forbids, responsive to the deviation likelihood (706) exceeding unity. The numerator of that quotient is the difference between the need quantity (700) and the dynamic ethical threshold (702); its denominator is the product

of the empathy weighting (704) and the self-esteem aggregate (108). On admission, a permitted deviation record (710) is appended comprising a deviation trigger signature recording the need-threshold imbalance at admission, a context hash capturing the environmental and affective values then in force, an integrity displacement vector quantifying the degree and direction of deviation across the three integrity components, an identification of the policy constraint overridden, and a restoration status.

The entropy weighting attaching to such an event is computed rather than declared. Its dissonance weight component is the count of declared members of the declared-intent record for which the executed member does not match the declared member, divided by the count of declared members, with the unit interval as its domain. Since each recorded impact is written at the time of the event and not recomputed, an entry in the sequence stands as it was made.

Forecasting of the deviation likelihood (706) is the first consuming stage. Within the deviation likelihood computation, the anticipated semantic impact that feeds the empathy weighting (704) is a projection of the proposed mutation into a tri-scope harm mapping, drawn from the current affective state overlay, from entries of the memory field (102) recording similar prior conduct, from forecast outcomes where a forecasting stage is present, and from the policy references governing acceptable harm per scope. The forecast contribution is conditioned on such a stage being present.

The underwriting disclosure comprising the deviation deductible and the aggregate retention (800) apparatus is the second. Upon each permitted deviation record (710), the entropy-weighted harm coefficient of the deviation is drawn first against the deductible. Harm up to the deductible is borne by the agent as a decrement of the self-esteem aggregate (108) for which no reparation arc is created and no discharge is available, the drawing being performed without regard to, and without the agent performing, any determination of whether the deviation was well founded. Harm exceeding the deductible creates an arc, and its amount accumulates in a retention register the agent maintains in the memory field (102), that of an unaddressed arc at

the declared multiple. Where the accumulated undischarged amount exceeds the aggregate retention (800), the permission condition (712) is foreclosed: a deviation likelihood (706) exceeding unity thereafter produces the withholding outcome and not the admission outcome, until discharge of pending arcs returns the register below the aggregate retention (800).

One denomination runs through that second stage. The deductible, the amount accumulated in the register, and the aggregate retention (800) are each denominated in the units of the entropy-weighted harm coefficient, the amount by which a deviation's coefficient exceeds the deductible being accumulated as a coefficient amount and not as a decrement amount.

Paragraph [0503] states the operative property in terms of consumption: the trajectory is available as an input to both stages and not a record merely readable.

Availability carries a condition. Continuity of the append-only lineage field (104) is a precondition of the trajectory's availability to each stage, so that a break in that continuity is detectable as a loss of the trajectory each stage may consume.

3. Declared Parameters and What Is Left to Policy

Parameters declared for this mechanism and the apparatus it feeds:

- **Ordering and mutability.** The sequence is ordered and append-only, carried in the append-only lineage field (104), from which entries are neither removed nor modified. One signature is recorded upon a deviation.
- **Denomination.** The deviation deductible, the amount accumulated in the retention register, and the aggregate retention (800) are each denominated in the units of the entropy-weighted harm coefficient.

- **Draw form.** The deductible is drawn per permitted deviation record (710), the full deductible standing available against each such record irrespective of prior draws; or, where so declared, per retention interval, each record within the interval drawing against the balance remaining and the balance being restored upon commencement of the next interval. The register is not written by the commencement of an interval, and the form applied is recorded with each draw.
- **Retention monotonicity.** The aggregate retention (800) is subject to a monotonically non-increasing floor over values admitted from successor signed policy objects (112). A declared value greater than the floor is not admitted while a retention foreclosure record (808) stands unreversed.
- **What elapsed time does not do.** Elapsed time discharges no arc, restores no authorization, and terminates no deviation-preparation state (708).
- **Magnitudes.** The deductible, the aggregate retention (800), the scope coefficients, the impact coefficients, and the base decrement are each declared in the signed policy object (112), the impact coefficients being non-negative values summing to unity. A single numeric trace appears in the filing by way of illustration only: a deductible of 2.0 units of the coefficient, an aggregate retention (800) of 10.0 units, and a retention register opening at 0.
- **The bound.** The deviation likelihood (706) is compared against unity.

4. Placement Within the Permitted Deviation Apparatus

Paragraph [0503] is filed among further integrity and propagation-halt embodiments, immediately after the propagation halt that suspends propagation of any state change while the agent carries any undischarged reparation arc (804).

Upstream sections supply the quantities carried forward here. The self-esteem section supplies the entropy-weighted harm coefficient and the restoration asymmetry; the permitted-deviation section supplies the quotient, the deviation-preparation state (708), and the contents of the permitted deviation record (710); the restorative-

mutation section supplies the anchored, self-recognizing act that discharges an arc; and the deductible-and-retention section supplies the register and the aggregate retention (800).

Downstream of the register sits the counterparty-directed reparation apparatus. An other-directed reparation arc (804) is reducible only by a completed matched pair (600) with the party recorded as harmed, and an unaddressed reparation arc by nothing; where the accumulation consists wholly of unaddressed reparation arcs, the loss of the capacity to deviate is permanent. Upon appending a retention foreclosure record (808), the agent emits a structured inquiry to its principal identifying the accumulated amount, the aggregate retention (800) applied, and each pending reparation arc (804) with its designation.

A further embodiment declares the aggregate retention (800) per integrity scope of the scoped integrity vector (106), each arc assigned to exactly one component and the two thresholds tested independently, either component's accumulation exceeding its corresponding retention sufficing to fire the foreclosure.

5. Distinction from Scoring, Attestation, and Adjudicated Metering

Registry-held reputation and trust scores. Such systems compute a score for an entity from ratings supplied by other entities and locate that score at a registry, a scoring authority, or a shared ledger, the scored entity neither holding the score nor participating in its computation. Defenses against unfair ratings filter incoming ratings before aggregation, the filtering party being a disinterested aggregator rather than the rated entity. The trajectory described here is instead carried by the agent itself, composed of its own recorded deviations, and consumed by stages internal to its own permission and metering apparatus.

Behavioral integrity scoring against a baseline. Two patents are addressed in the filed background: U.S. Patent No. 12,563,045, which computes an integrity score for an agent from observed execution against expected behavior, compares it against a threshold, and modifies capability upon that comparison; and U.S. Patent No. 12,526,244, which maintains a reputation value with decay and penalty values and removes a probationary status after an interval of operation without incident. The background characterizes both as conformity detectors running in one direction, divergence narrowing capability, neither carrying a quantity representing the need or urgency of the action attempted, and both treating uneventful operation as positive evidence, so that neither can express a permitted deviation. In the filed architecture, elapsed time discharges no arc and restores no authorization, and the governing quotient's numerator is a need quantity (700) less a dynamic ethical threshold (702).

Tamper-evident logging and remote attestation. Accountability protocols for distributed systems prove node misbehavior from tamper-evident logs, the verdict being held by auditors: witness nodes collect evidence and third parties verify the proof. Remote attestation architectures likewise locate appraisal of evidence in a verifier and the grant or denial of authority in a relying party. Those designs deliver an answer about a log or a state to an appraising party. The mechanism here conditions the availability of a trajectory to two named consuming stages of the agent itself, a break presenting as a loss at the point of consumption.

Evaluation harnesses and observability platforms. Such platforms record traces of agent execution, cluster failures, and present findings to human operators, terminating in a ticket, a dashboard entry, or a curated dataset; the evaluated agent is unchanged, and correction reaches it, if at all, through a subsequent human-initiated code change or retraining. The sequence described here is not a finding presented to an operator; it is an input to a forecasting stage and to a deductible-and-retention apparatus whose foreclosure governs whether a later deviation is admitted.

Merit-adjudicated institutional metering. Regimes attaching a consequence to a party's conduct condition it on a prior adjudication performed by an institution other than the penalized party; the filed background cites Article 23(2) of Regulation (EU) 2022/2065, Section 623(a)(8)(F) of the Fair Credit Reporting Act, and model unfair-claims-practices provisions promulgated by the National Association of Insurance Commissioners. Here the draw against the deviation deductible is performed without any determination of whether the deviation was well founded, and the accumulation it feeds is tested against a policy-declared bound, the foreclosing being performed by the agent from state carried in its memory field (102) and without adjudication by any other party.

No category above is disparaged, and nothing in this article asserts or implies that any product or party practicing these approaches infringes anything. The distinction drawn is structural.

6. Disclosure Scope

The operative, citable disclosure is U.S. Provisional Application No. 64/117,812, Section 10.14, paragraph [0503], which discloses: maintenance by the persistent semantic agent of an ordered, append-only sequence of entropy signatures in the append-only lineage field, each signature recorded upon a deviation; the constitution of that sequence as a coherence trajectory specific to the agent and not erasable without breaking the continuity of that field; the availability of the accumulated entropy signature as a machine input to the forecasting of the deviation likelihood and to the underwriting disclosure comprising the deviation deductible and the aggregate retention apparatus; its character as an input to both stages and not a record merely readable; and the continuity of the append-only lineage field as a precondition of its availability to each stage, so that a break in that continuity is detectable as a loss of the trajectory each stage may consume.

No numeric value is asserted here beyond the single trace the filing supplies by way of illustration only. Third-party pricing of indemnity against an agent's recorded conduct, any price computed from quantities read out of a presented lineage field, worked numeric traces across successive deviations, and deployment examples are not disclosed here and are reserved to the applicant. Nothing in this article enlarges, narrows, or supersedes the filed provisional, which controls.

Integrity Quantities and Permitted Deviation (</permitted-deviation>)

[All 49 steps → \(/inventive-steps\)](#)

Bounded, accountable deviation from declared values — measured, not forbidden.

Provisional application

PRIMARY TECHNICAL DISCLOSURE

- [Permitted Deviation: Bounded, Recorded Departure From an Agent's Declared Values \(/articles/permitted-deviation/bounded-departure-from-declared-values\)](/articles/permitted-deviation/bounded-departure-from-declared-values)

SECONDARY TECHNICAL

- [A Typed, Dimensionless Conduct Divergence Measure \(/articles/permitted-deviation/typed-dimensionless-divergence-measure\)](/articles/permitted-deviation/typed-dimensionless-divergence-measure)
- [The Policy-Difference Set and Policy-Explained Divergence \(/articles/permitted-deviation/policy-explained-divergence\)](/articles/permitted-deviation/policy-explained-divergence)
- [Residual Divergence and Its Confined Consumption \(/articles/permitted-deviation/residual-divergence-confined-consumption\)](/articles/permitted-deviation/residual-divergence-confined-consumption)
- [Propagation Halt on Undischarged Reparation Arcs \(/articles/permitted-deviation/propagation-halt-undischarged-arcs\)](/articles/permitted-deviation/propagation-halt-undischarged-arcs)
- [Attack-Conditional Propagation Suspension \(/articles/permitted-deviation/attack-conditional-propagation-suspension\)](/articles/permitted-deviation/attack-conditional-propagation-suspension)
- [Entropy Signature Trajectory as Machine Input to Deviation Forecasting and Underwriting Disclosure \(/articles/permitted-deviation/entropy-trajectory-available-forecasting-underwriting-disclosure\)](/articles/permitted-deviation/entropy-trajectory-available-forecasting-underwriting-disclosure)

- [Single-Computation Routing Restriction: Confining a Verified Impairment Disclosure to the Empathy Weighting of the Receiver's Permitted-Deviation Quotient \(/articles/permitted-deviation/single-computation-routing-restriction-one-way\)](/articles/permitted-deviation/single-computation-routing-restriction-one-way).
- [Impairment Terminal State and Release: Withdrawing an Agent From Deviation Preparation Toward a Disclosed-Impaired Counterparty \(/articles/permitted-deviation/impairment-terminal-state-release\)](/articles/permitted-deviation/impairment-terminal-state-release).

APPLICATIONS · GENERAL

- [Regulated Industries: Recording a Bounded Departure From Declared Policy \(/articles/permitted-deviation/regulated-industry-deviation\)](/articles/permitted-deviation/regulated-industry-deviation).
- [Robotics Safety Envelopes: Deviation as a Measured Quantity \(/articles/permitted-deviation/robotics-safety-envelopes\)](/articles/permitted-deviation/robotics-safety-envelopes).

APPLICATIONS · SPECIFIC

- [ISO/IEC 42001 AI Management Systems: Declared Policy, Recorded Departure \(/articles/permitted-deviation/iso-iec-42001-ai-management\)](/articles/permitted-deviation/iso-iec-42001-ai-management).

TERMINOLOGY

- [aggregate retention \(/glossary#aggregate-retention\)](/glossary#aggregate-retention)
- [deviation deductible \(/glossary#deviation-deductible\)](/glossary#deviation-deductible)
- [deviation likelihood \(/glossary#deviation-likelihood\)](/glossary#deviation-likelihood)
- [entropy-weighted harm coefficient \(/glossary#entropy-weighted-harm-coefficient\)](/glossary#entropy-weighted-harm-coefficient)
- [need quantity \(/glossary#need-quantity\)](/glossary#need-quantity).
- [permitted deviation \(/glossary#permitted-deviation\)](/glossary#permitted-deviation).
- [self-esteem aggregate \(/glossary#self-esteem-aggregate\)](/glossary#self-esteem-aggregate).

[Integrity Quantities and Permitted Deviation overview → \(/permitted-deviation\)](/permitted-deviation)