

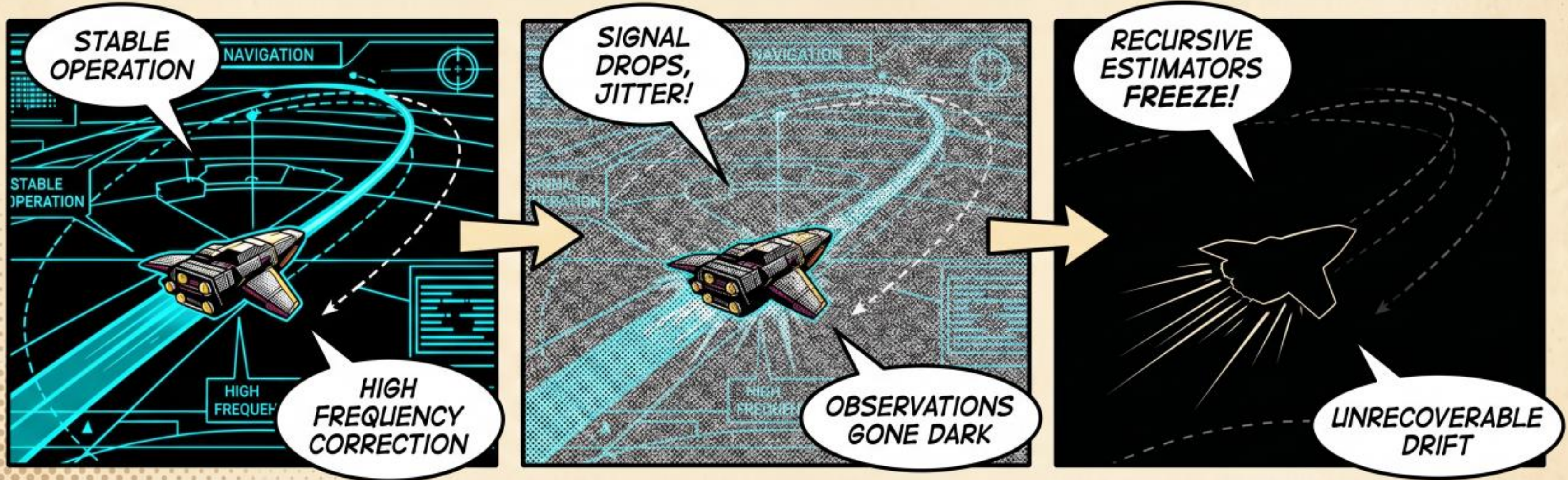
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Navigation Beyond
Signal Loss.

LOST IN THE VOID

CONVENTIONAL SYSTEMS (KALMAN, HMM) EXCEL IN CLEAN CONDITIONS BUT COLLAPSE UNDER DEGRADATION. THEY CAN HALUCINATE CERTAINTY OR FREEZE WHEN OBSERVATIONS GO DARK. THIS IS THE *T-FREQUENCY DEPARTURE*: THE CRITICAL MOMENT WHERE SIGNAL FREQUENCY DROPS BELOW THE THRESHOLD FOR STABLE RECURSIVE CORRECTION. UNIVERSAL CHALLENGE FOR AUTONOMOUS NAVIGATION.



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THREE SYSTEMS ENTER THE ARENA

KALMAN FILTER THE GOLD STANDARD



Precise estimation for clean trajectories.

RECURSIVE ESTIMATOR: Predicts & Corrects under benign noise.

DOMAIN: Clean labelled routes.

KEY TRAIT: Optimal for predictable noise.

WEAKNESS: High uncertainty & blackout.

HMM-STYLE MAP MATCHING THE PROBABILISTIC INTERPRETER



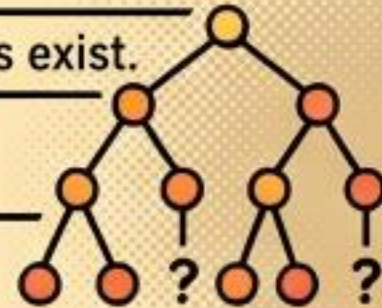
Finds the best path among defined alternatives.

DISCRETE BRANCH-STATE INTERPRETATION.

DOMAIN: Strong rooted labels exist.

KEY TRAIT: Efficient where map is clear.

WEAKNESS: Brittle under ambiguity.



NashMark AI EQUILIBRIUM-GOVERNED TRAVERSAL



continuidad preserved through multi-agent governance.

Dualens equilibrium system
 Balanced inputs
 Corridor Inner Equilibrium, Refinement, Safe-Envelope Gating
 Domains Degraded Ambiguous, Inputs
 Balianced Aetention

PRESERVES CONTINUITY.

DOMAINS: Degraded, Ambiguous, Blackout.

MECHANISMS: Corridor Retention, Inner Equilibrium Refinement, Governance Stability, Safe-Safe-Envelope Gating.


KEY FIND: Wins on continuity rate.

THE QUESTION IS NOT WHICH WINS EVERYWHERE. IT IS WHICH WINS WHEN NAVIGATION BECOMES A CONTINUITY PROBLEM UNDER UNCERTAINTY.

CONTINUITY IS KING

19

 Navigation is *State Preservation*.

 Preserve state coherence, restore from drift, defer unsafe commitment.

The Path Remembers.

Equilibrium Closure ($\Delta t = 0$) is the Goal

Net Traversal Imbalance (Δt)


Destabilising Load


Stabilising Structure

Continuity Indicator 



THE TRAJECTORY CORRIDOR

RETENTION,
NOT COLLAPSE

LATENT PATHS
DEFINED AT STEP t

MULTIPLE LATENT
TRAVERSAL
STATES (j)

CORRIDOR
RETENTION
THRESHOLD (τ)



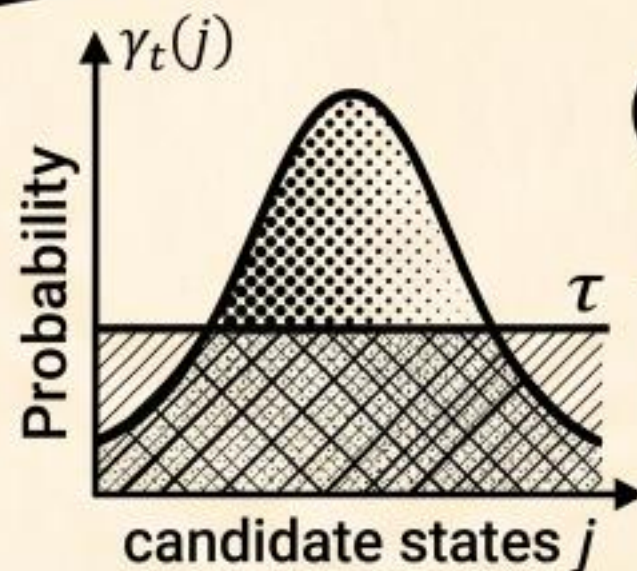
POINT
TRACKER



GOVERNED
FLOW SYSTEM

$$\Gamma_t = \{j \mid \gamma_t(j) \geq \tau\}$$

$$\Gamma_t = \{j \mid \gamma_t(j) \geq \tau\}$$



POINT
TRACKER



GOVERNED
FLOW SYSTEM

STRUCTURED AMBIGUITY
MAINTAINED UNDER
DEGRADED OBSERVATION

CORRIDOR WIDTH MEASURES
RETAINED STATES
(AVERAGE 1.7-1.8 EDGES)

EQUILIBRIUM THRUSTERS



19

MORAL STRUCTURAL STABILITY (MSS)

Cooperative (C) Mass

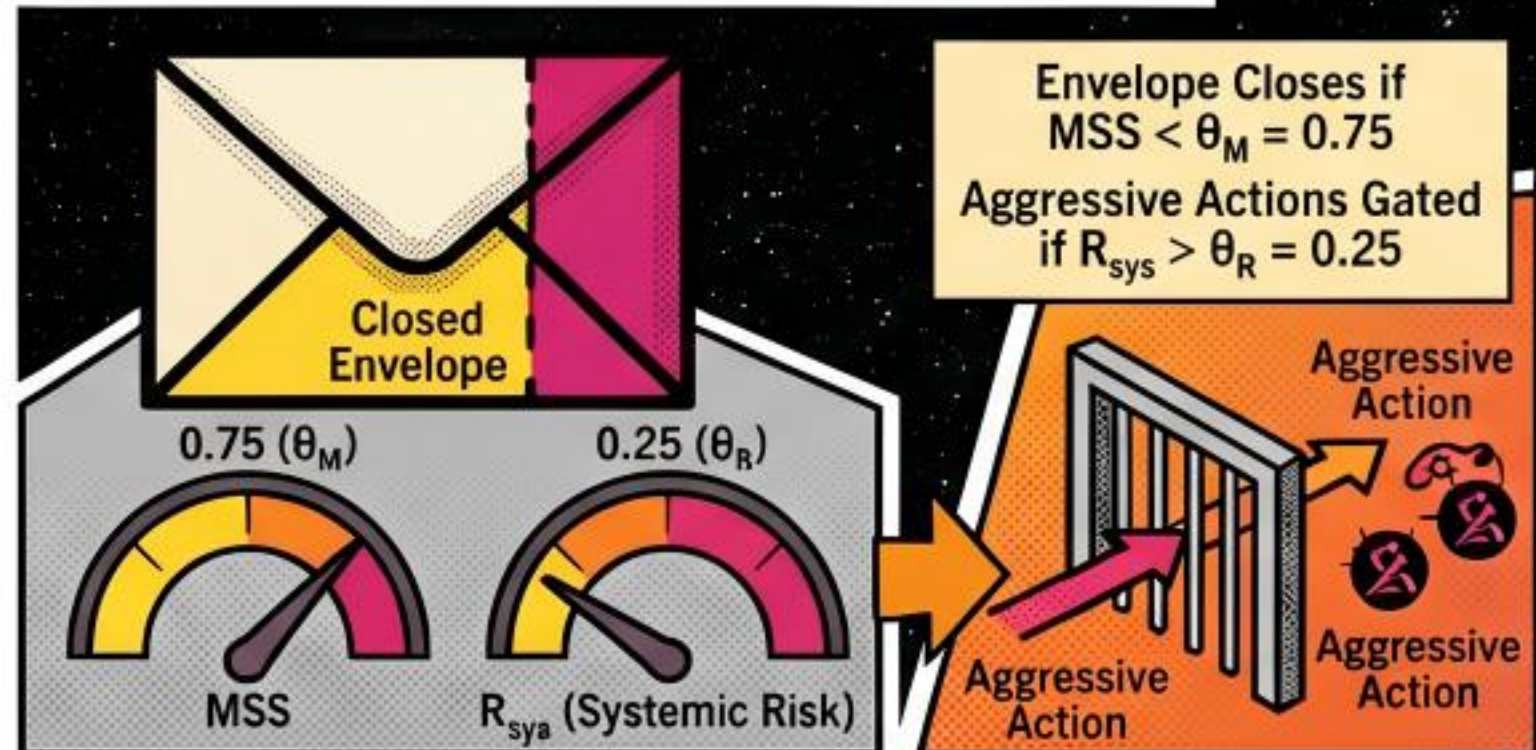
Defection (D) Mass

Core Equilibrium Metric.
Defined as ratio of
Cooperative Mass (C) to
total System Mass (C+D).
Tracks Stabilizing Regime.

$$\left[\text{MSS}(t) = \frac{C(t)}{C(t) + D(t)} \right]$$

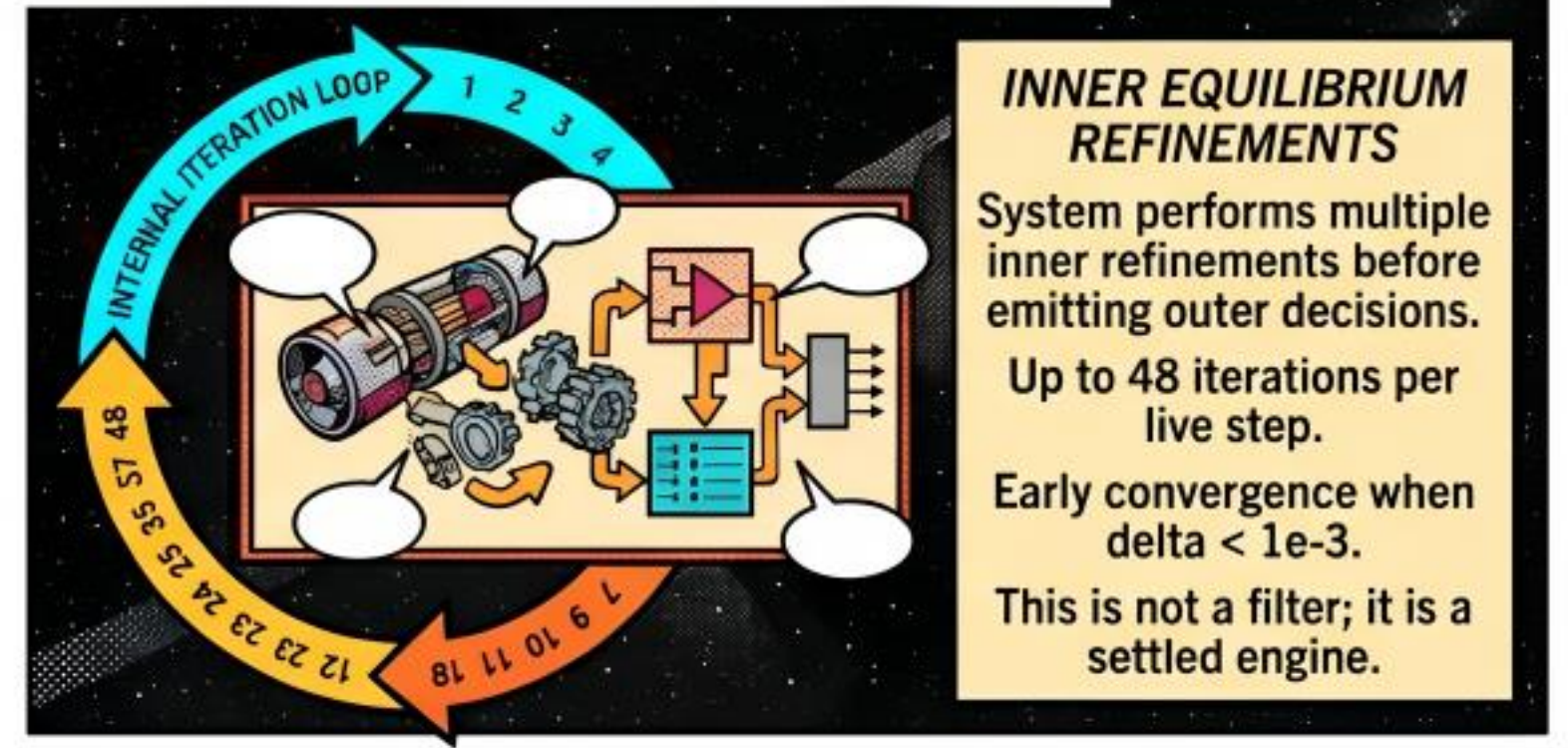
19

OPERATING ENVELOPE & GATING



19

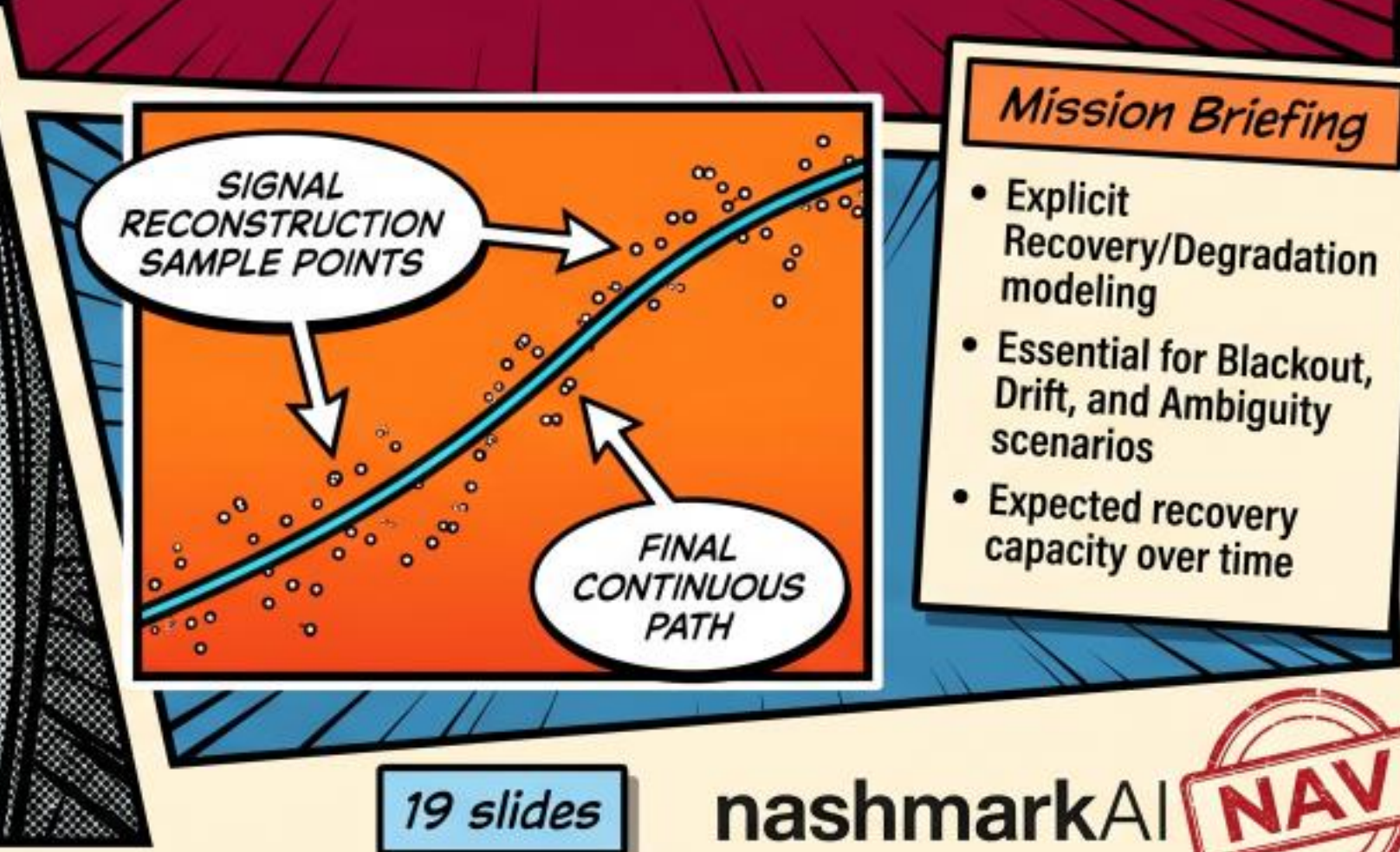
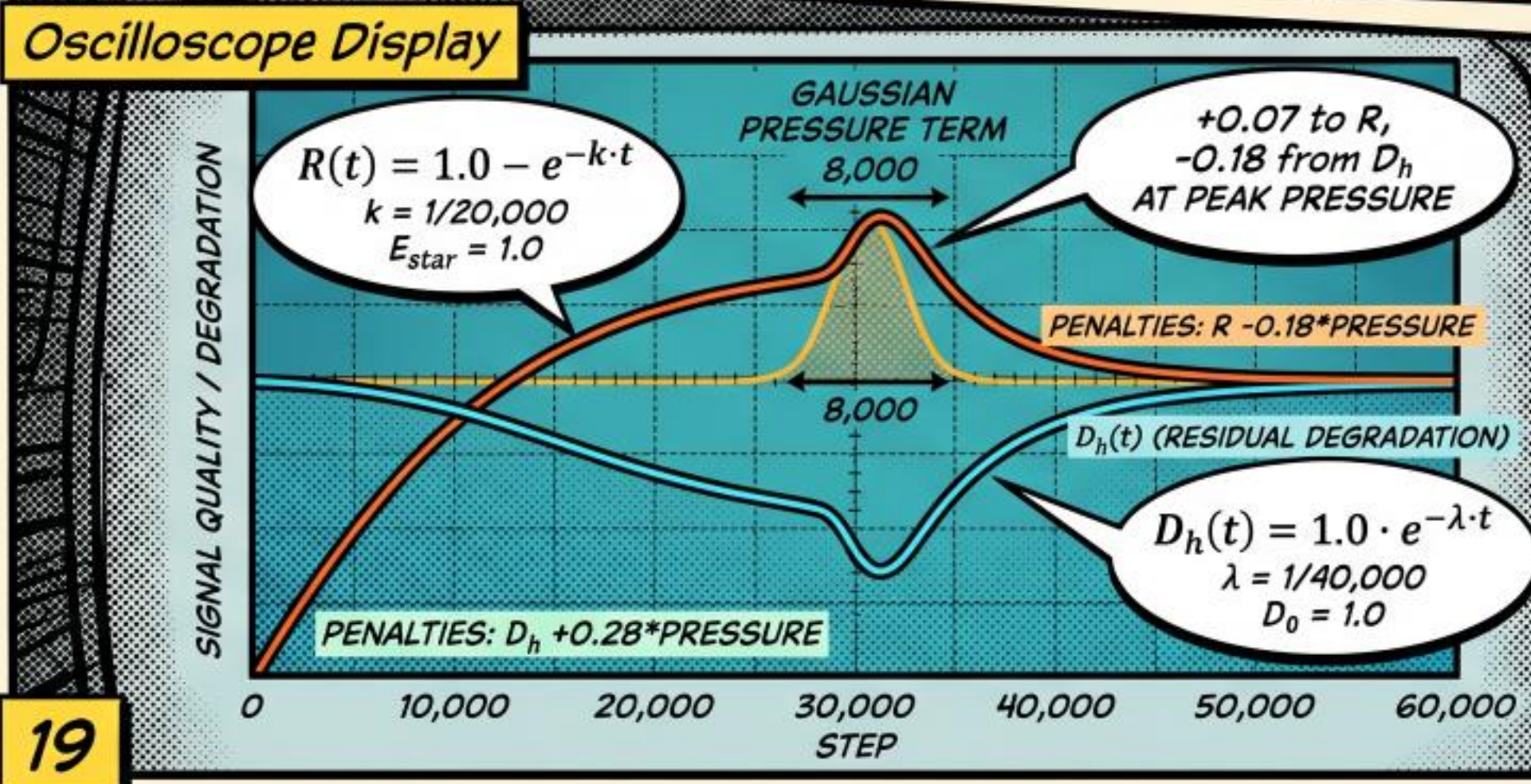
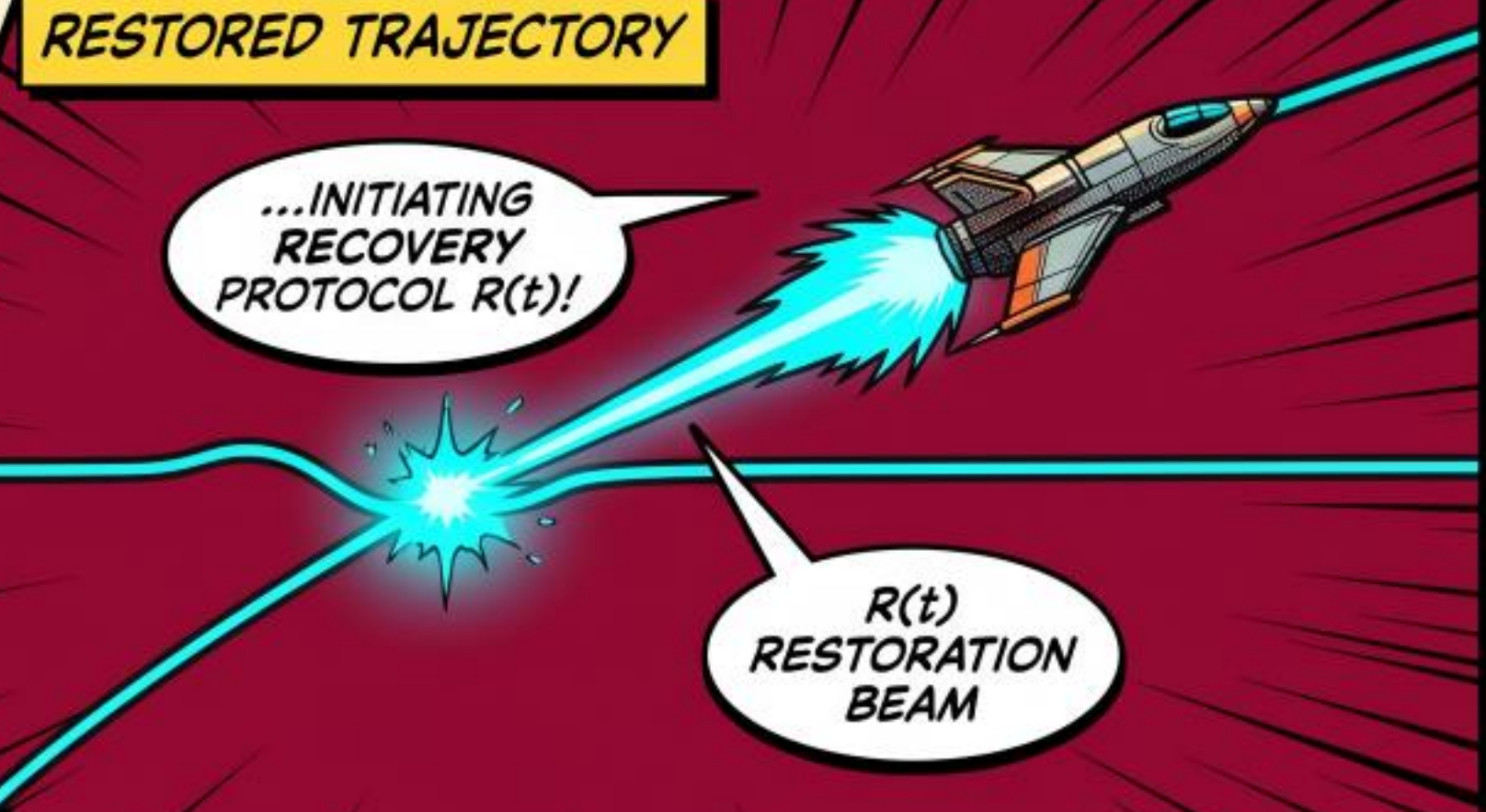
SETTLED ENGINE ITERATIONS



19

19

SIGNAL RESTORATION



BLACKOUT DECAY

NORMAL SIGNAL / EARLY DECAY

CONVENTIONAL:
Blind Extrapolation/Freeze.
NASHMARK: Governed Decay ($D_h(t)$).



$D_h(t)$ degrades exponentially with half-life $1/\lambda_h$.

Accumulated Uncertainty
+ 0.28 * pressure.
 D_h accumulates pressure signal.



PRESSURE

TOTAL BLACKOUT / FALLBACK

**Memory Fades.
Equilibrium Holds.**

Observation: *NONE*.
FALLING BACK to *Corridor
Target Projection* using retained
gamma probabilities &
previous corridor state.

NO HALLUCINATIONS.
stays within lawful band of possibility.

THE NAVIGATION COUNCIL



DOMINANT SIGNAL for ardac for (1-Pressure)

Monitors pressure for dominance validity

Tracks ambiguity for coherence



COHERENCE SIGNAL (1-Ambiguity)

GOVERNANCE STABILITY TRIANGLE

GOVERNANCE STABILITY $G(t)$

$$G(t) = w_c * \text{avg coop} + w_p * \text{policy alignment} - w_v * \text{volatility}$$

$w_c = 0.60$ $w_p = 0.25$ $w_v = 0.15$

COOPERATION EVOLVES

	START	MOVE TOWARDS
AGENT COOP.	0.80	
0.28	0.28	→
0.52	0.52	→
0.18	0.18	drift

decay noise

Governance push towards $\pi_{eq} = 0.80$



Evaluates long-term stability

COUNCIL'S PURPOSE

VOTES on whether to COMMIT, not on POSITION.

Is the system governable enough to commit?

Commits on GOVERNABILITY

SAFE OPERATING ENVELOPE

SAFE STATE GATING

COMMITMENT RULES

Navigation is gated unless conditions are unsafe.
CLOSED gates prevent:

- Branch Commitment
- Transition Hardening
- Aggressive Restoration

OPEN state applies:
+0.10 CORRECTION GAIN

Boundary:
cautious traversal
over structural
gambling.

GATING CONDITIONS (MSS)

EQUILIBRIUM GATE (MSS)

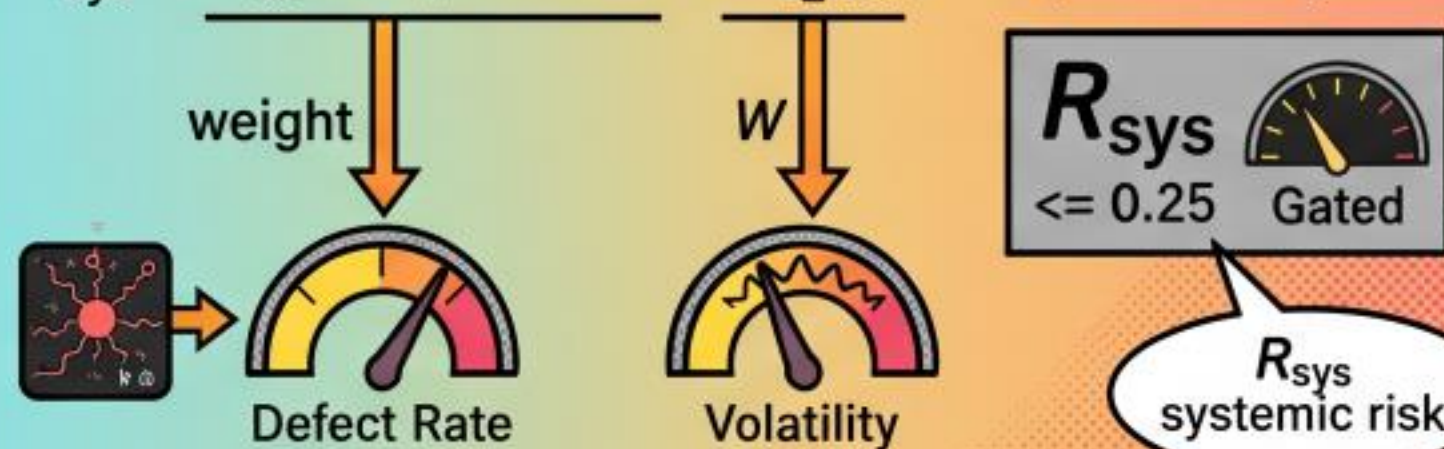


$MSS \geq 0.75$
(Simultaneous with $R_{sys} \leq 0.25$)

SYSTEMIC RISK COMPUTATION (R_{sys})

SYSTEMIC RISK GATE (R_{sys})

$$R_{sys} = w_d(0.70) * \text{Defect} + w_{v_risk}(0.30) * \text{Volatility}$$



SAFE OPERATING ENVELOPE HUD

SAFE TRAVERSAL

SAFE ENVELOPE

+0.10 GAIN applied...
Pulling state to coherence

WARNING ZONES

GATES OPENED

This is lawful state commitment,
not raw probability.

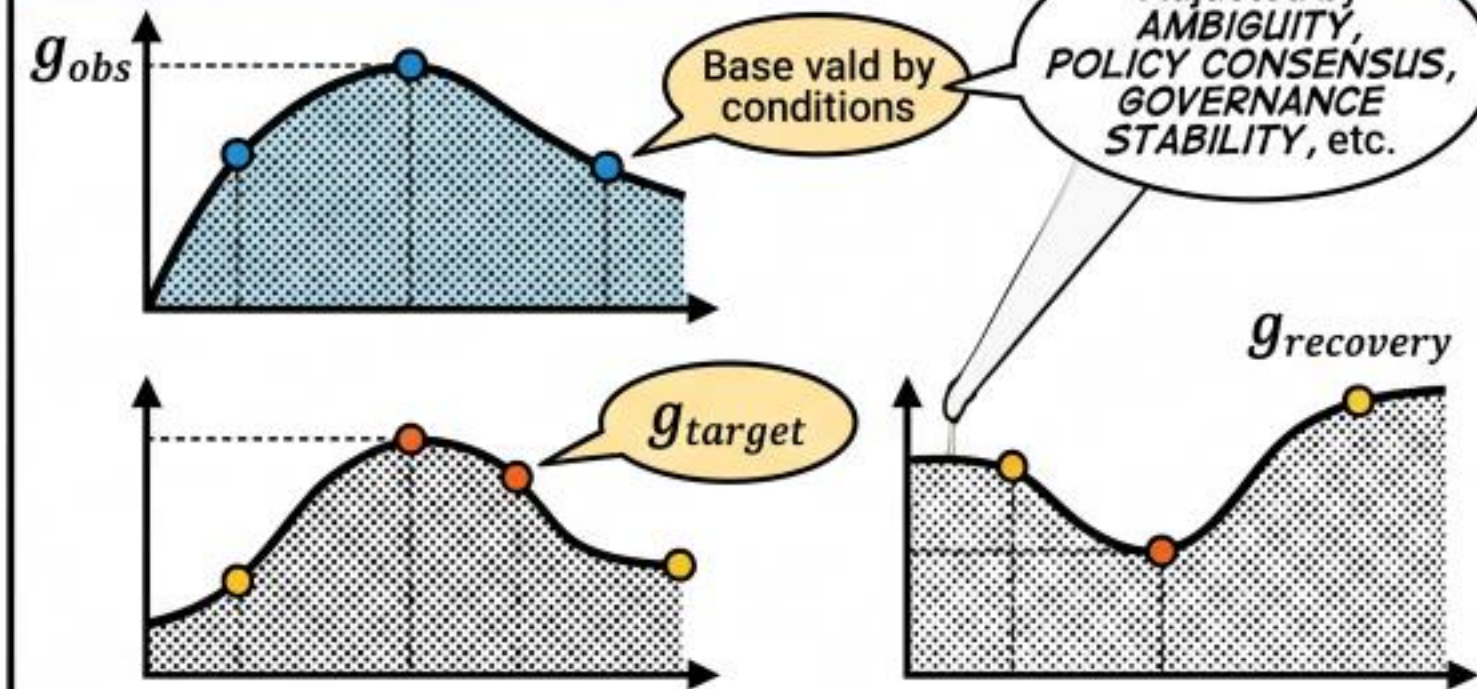
T-FREQUENCY MODULATORS

MODULATOR CONTROL PANEL



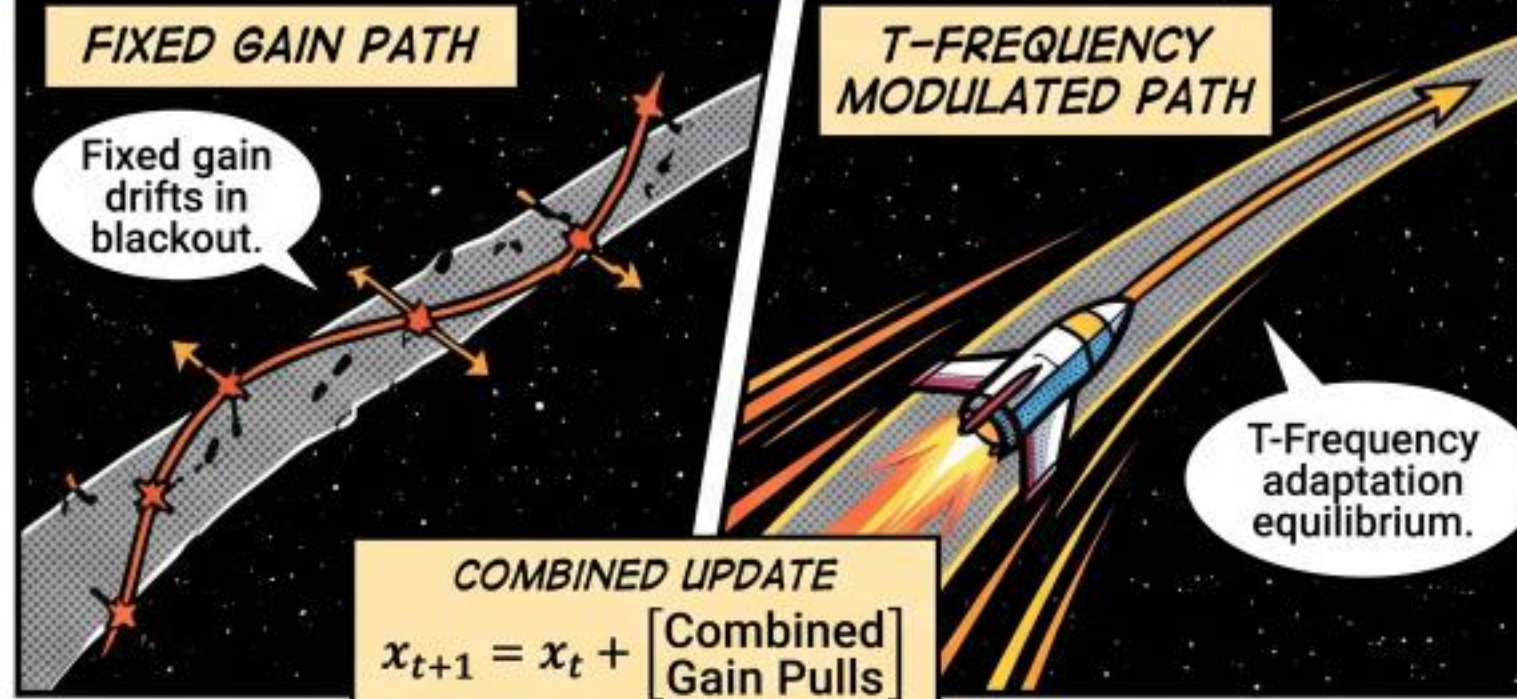
19-1

GAIN RESPONSE CURVES



19-2

BEFORE/AFTER TRAJECTORY



19-3

ACTION-STATE IMPACT

ACTION-STATE	BASE TARGET GAIN	BASE RECOVERY GAIN
COOPERATE	0.44	0.18
HOLD	0.30	0.12
DEFECT	raw obs emphasis	lower structural commitment

Higher target gain biases towards corridor adherence.

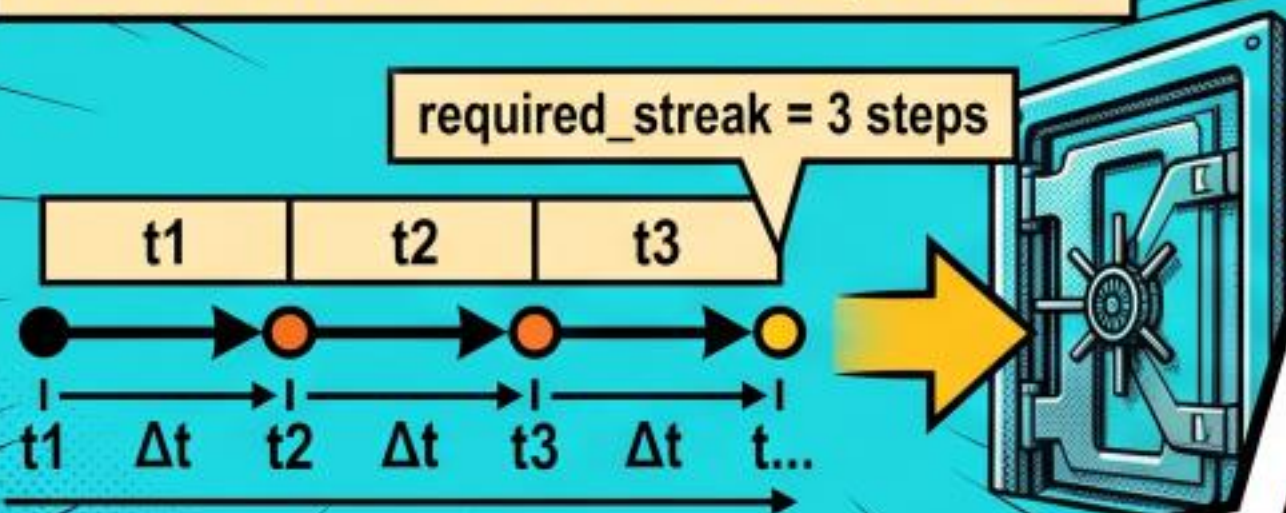
Key Finding	Outcome
Summary	Lower structural commitment lonts

19-4

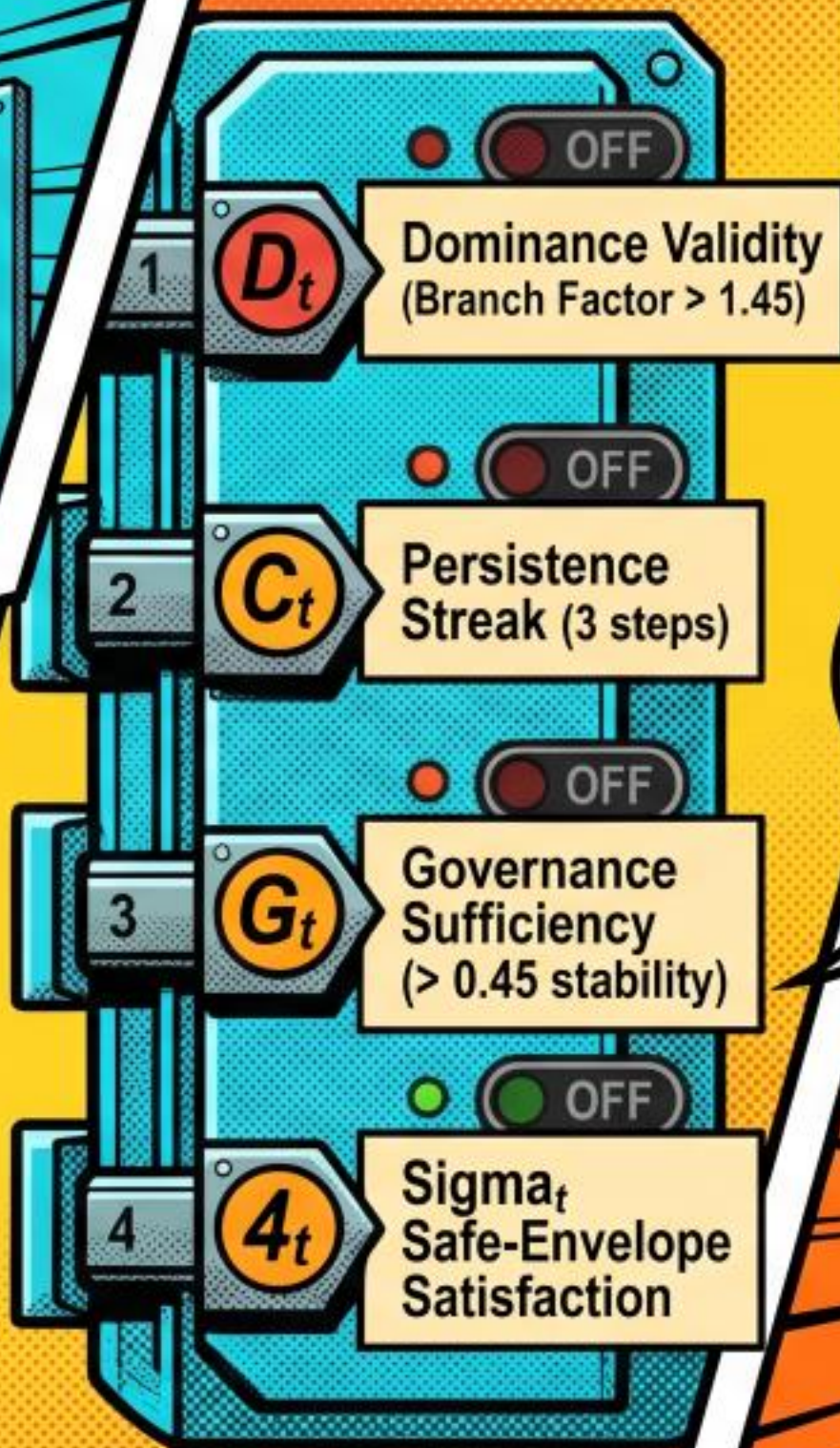
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COMMIT PROTOCOL

TEMPORAL GATING SEQUENCE



VAULT LOCK MECHANISM



COMMIT DECISION

UNCONFIRMED

CONFIRMED



None Streak 0



COMMIT WHEN CERTAIN.

RESET PROTOCOL



Dominance OK Fails!



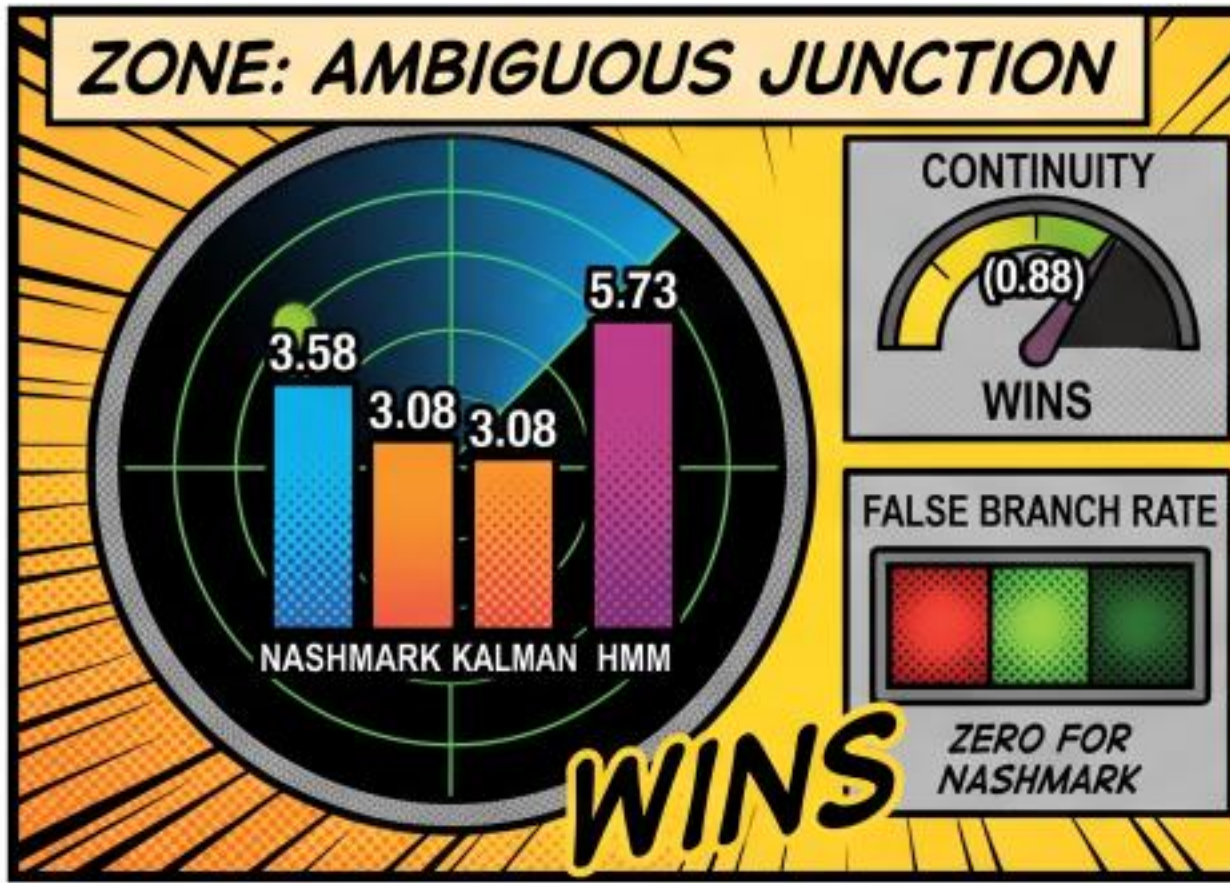
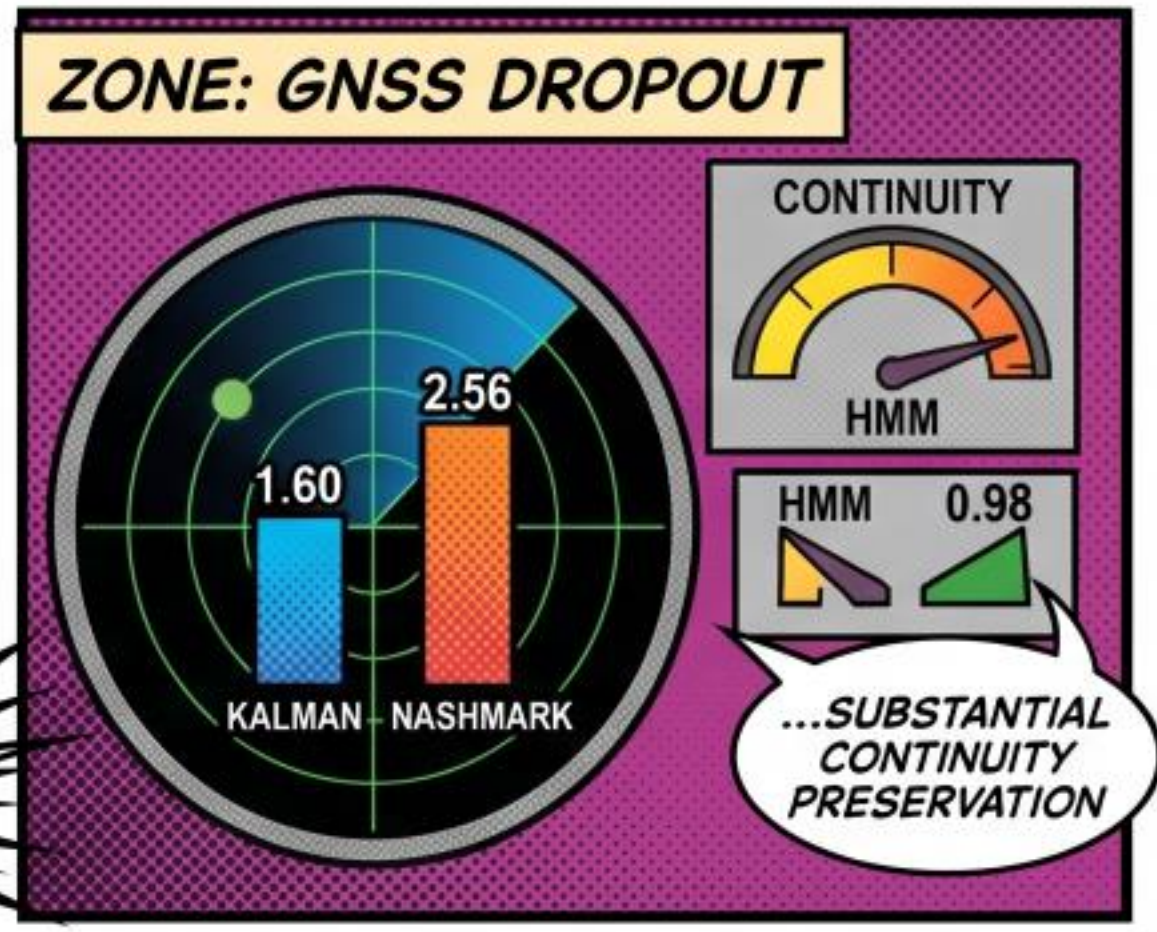
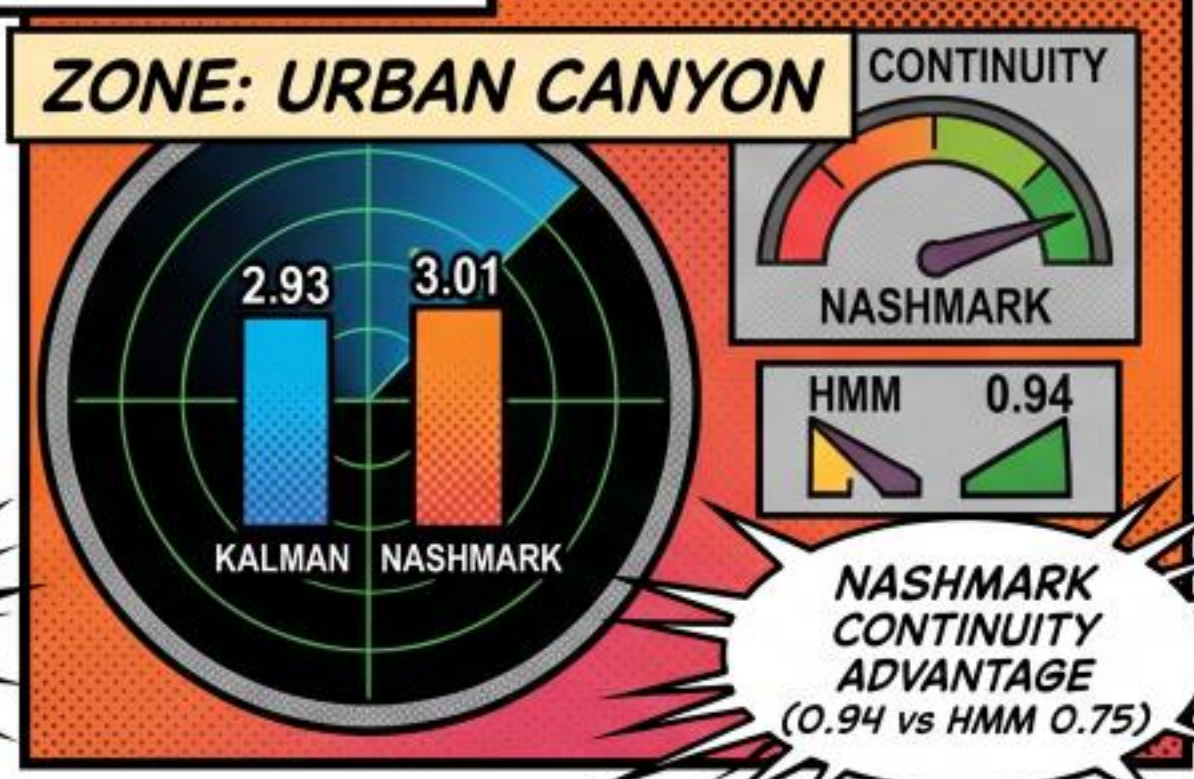
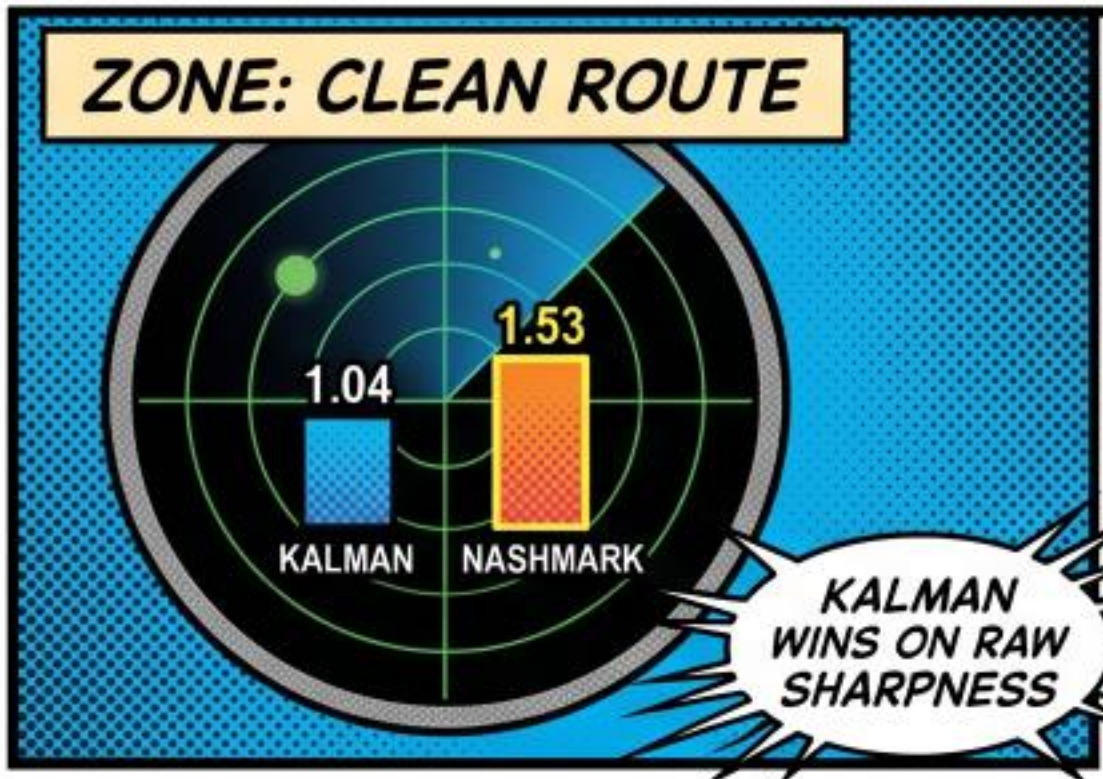
Reset to None Reset Streak to 0

EQUILIBRIUM LOGIC: State confirmed, not impulsively seized.

FIVE MISSION ZONES



19 MISSION TELEMETRY

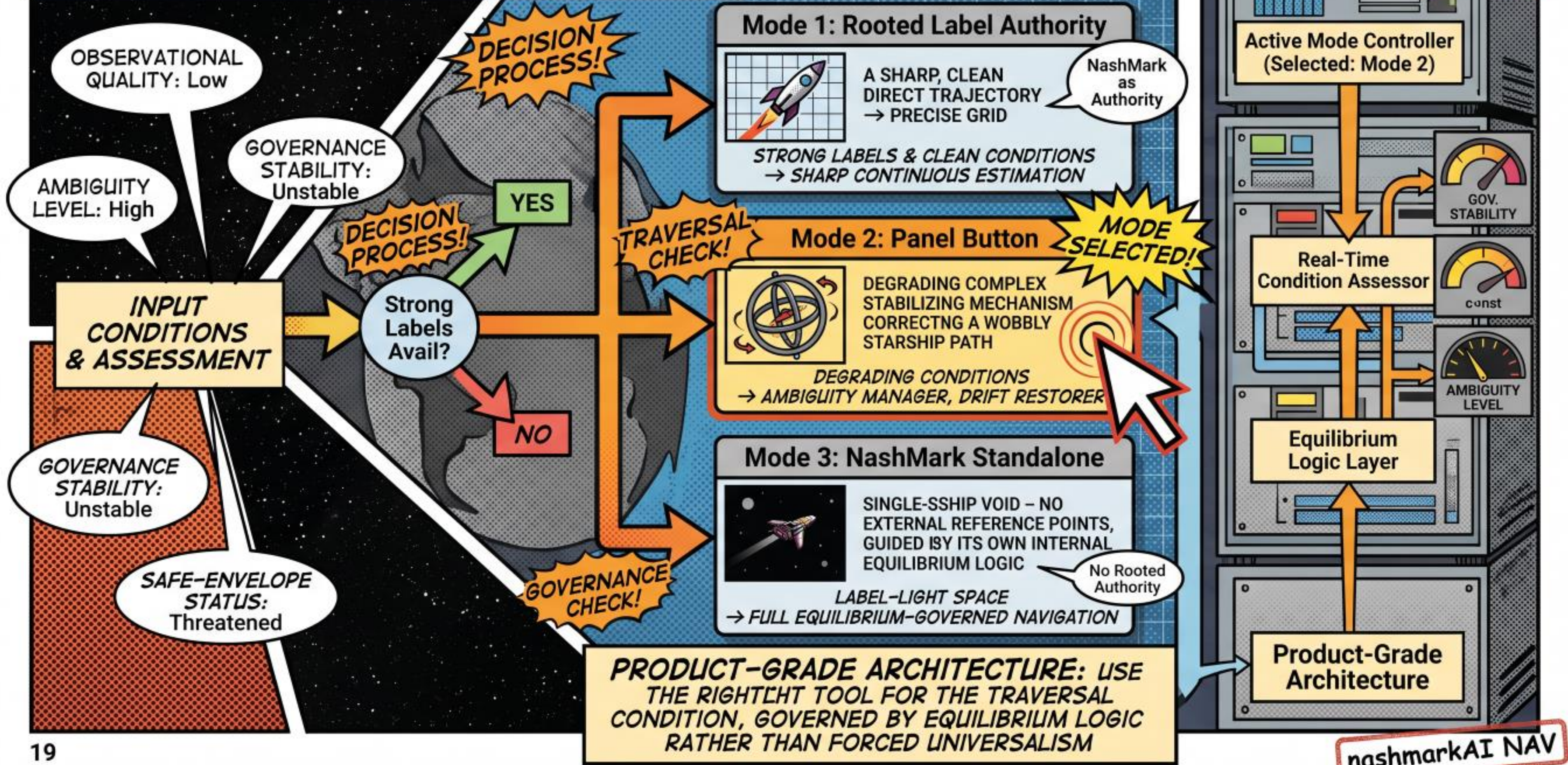


WINS

ZONE	KALMAN ERROR	NASHMARK ERROR	KEY FINDINGS
Clean Route	1.04	1.53	Kalman dominates clean.
Urban Canyon	2.93	3.01	NashMark continuity 0.94 > HMM 0.75
GNSS Dropout	1.60	2.56	NashMark continuity 0.98 > HMM 0.62
Ambiguous Junction	3.58	3.08	NashMark: Mean Error/Continuity/Zero False Branch Win
Drift Recovery	1.97	1.84	NashMark: Mean Error/Continuity/Efficiency 1.00 Win



SELECT NAVIGATION MODE



DEEP SPACE FRONTIERS

1. LUNAR FAR-SIDE

No Earth reference, surface ambiguity.

THE DANGER:
False Structural
Structural Commitment.
NASHMARK'S FEATURE:
Disciplined Doubt.

2. PLANETARY SHADOW

PLANETARY
SHADOW

3. INTERSTELLAR VOID

Long comm lag,
sparse reference.

*The Void
Awaits.*

Orbital GNSS
blackout, occultation
danger.

THE NASHMARK ADVANTAGE

DOC ID: NM-ADV-Q4

CLASSIFICATION: EGL/RESTRICTED

REFERENCE -01

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EQUILIBRIUM REFINEMENT



ors



NOT SINGLE-PASS

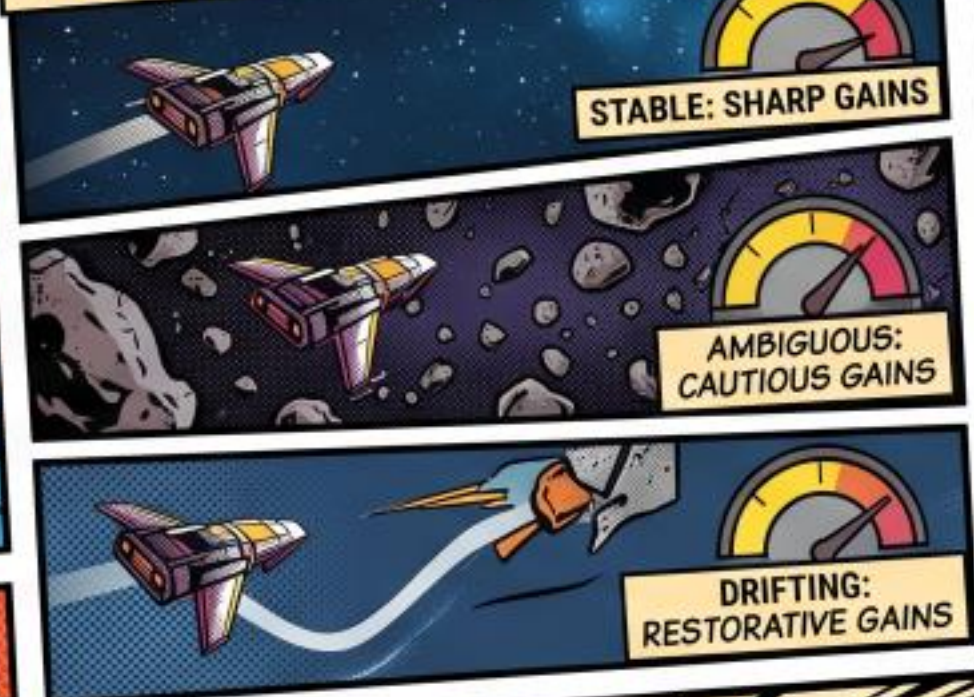
Refinement with Early Convergence

PROTECTED

SAFE OPERATING ENVELOPE



DYNAMIC GAIN MODULATION



GOVERNANCE STABILITY



Governance Council

3-Agent Council Considers Governability

3-Agent Council Considers Governability

TEMPORAL COMMIT GATING



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3-STEP PERSISTENCE ELIMINATES BRANCH FLAPPING

THE RESULT: Superior Continuity across Scenarios

- Zero False Branch Commits in Ambiguous Junction
- 1.00 Continuity in Drift Recovery
- 0.98 Continuity in GNSS Blackout

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CLASSIFICATION: PROTECTED

PUBLIC ACCESS INCLUDES:

Reduced Demo Model,
Route-Graph,
Kalman/HMM Baselines,
Metric Calculation.

WITHHELD CORE ENGINE (PROTECTED):

Full Sovereignty Control Core,
Production Implementation,
Proprietary Weighting
Strategies.

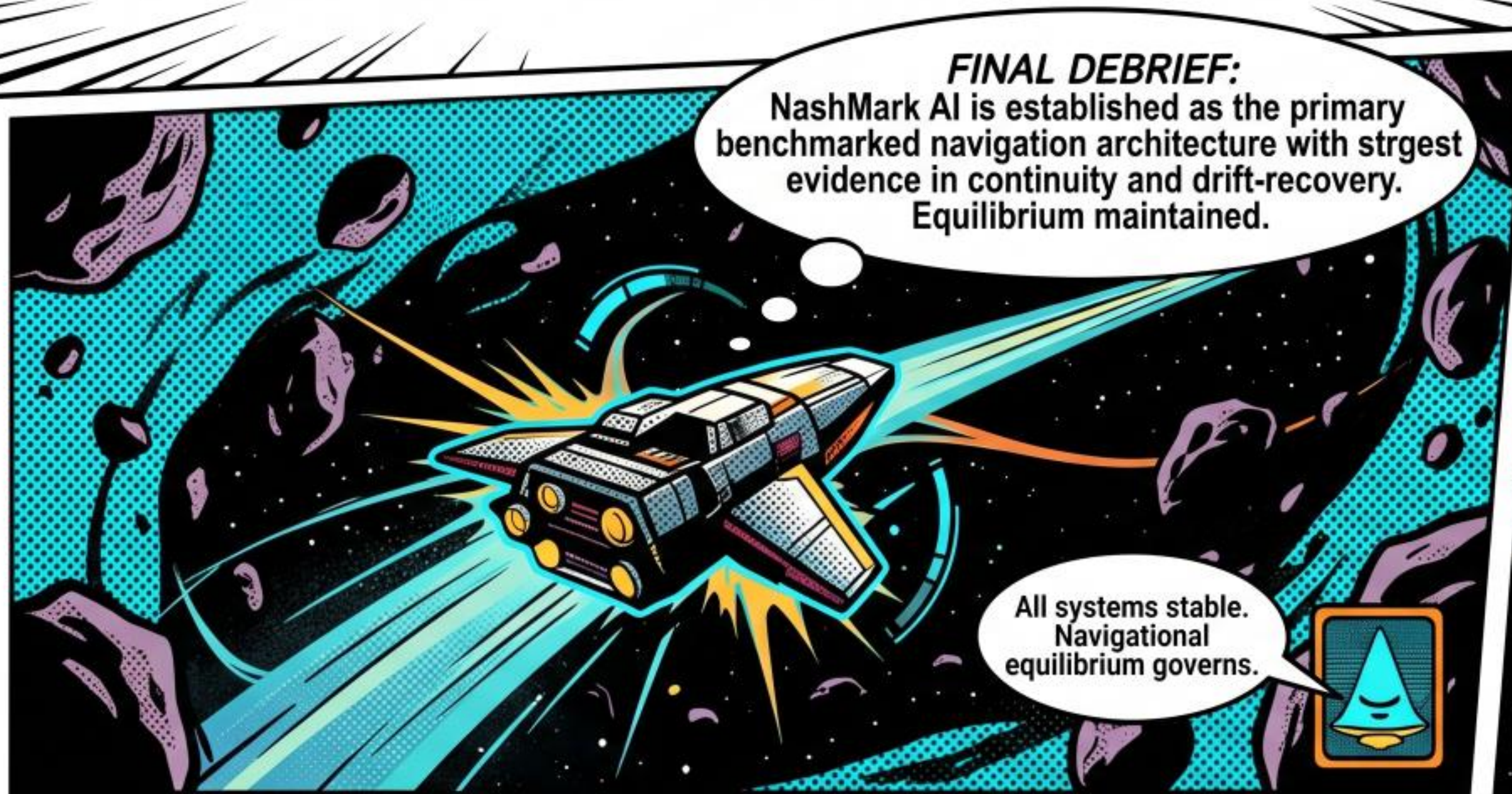


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Equilibrium is Maintained.
The proprietary core and refinement
routines remain with withheld.

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EQUILIBRIUM MAINTAINED



KEY CONCLUSIONS



NashMark AI governs where navigation becomes a continuity problem.

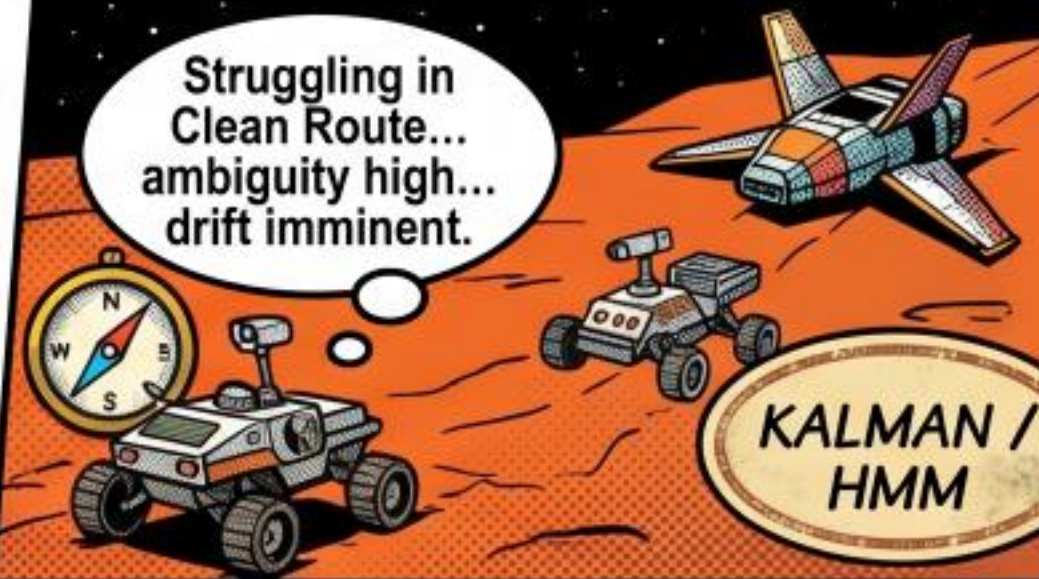


Strongest value in degraded, ambiguous, and continuity-sensitive environments.



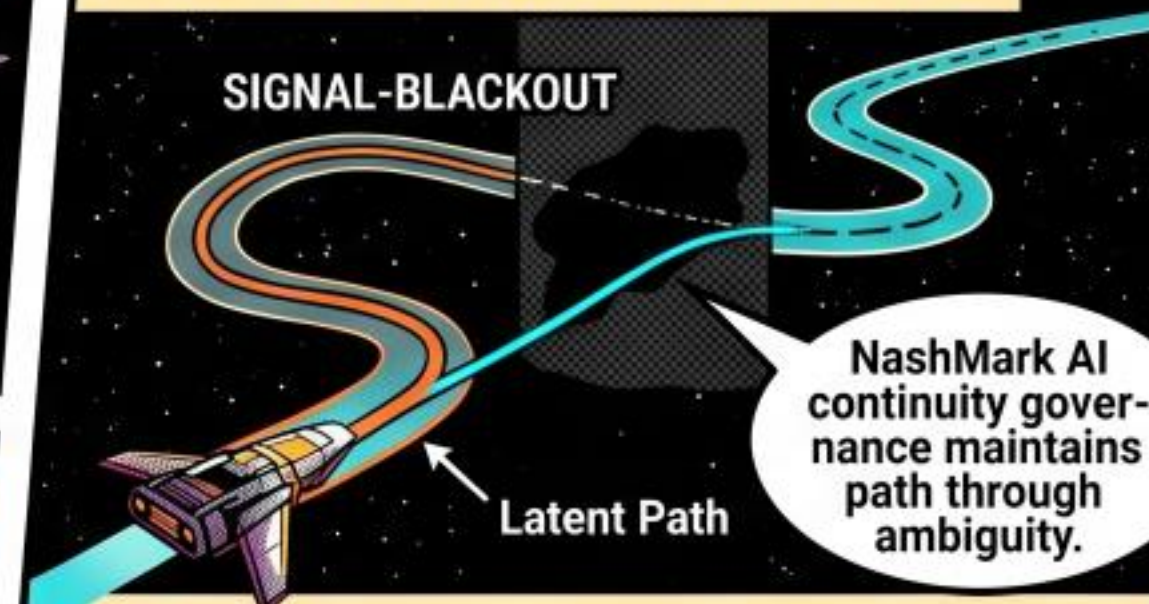
Branch-state performance expected to strengthen with internal label authority. Kalman still best for clean, HMM for discrete.

CONVENTIONAL SYSTEMS



Kalman retained for clean conditions; HMM for discrete labelling, but limited in degraded scenarios.

AMBIGUITY GOVERNANCE



Genuine independent value in equilibrium-governed traversal logic, even with light labelling.

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