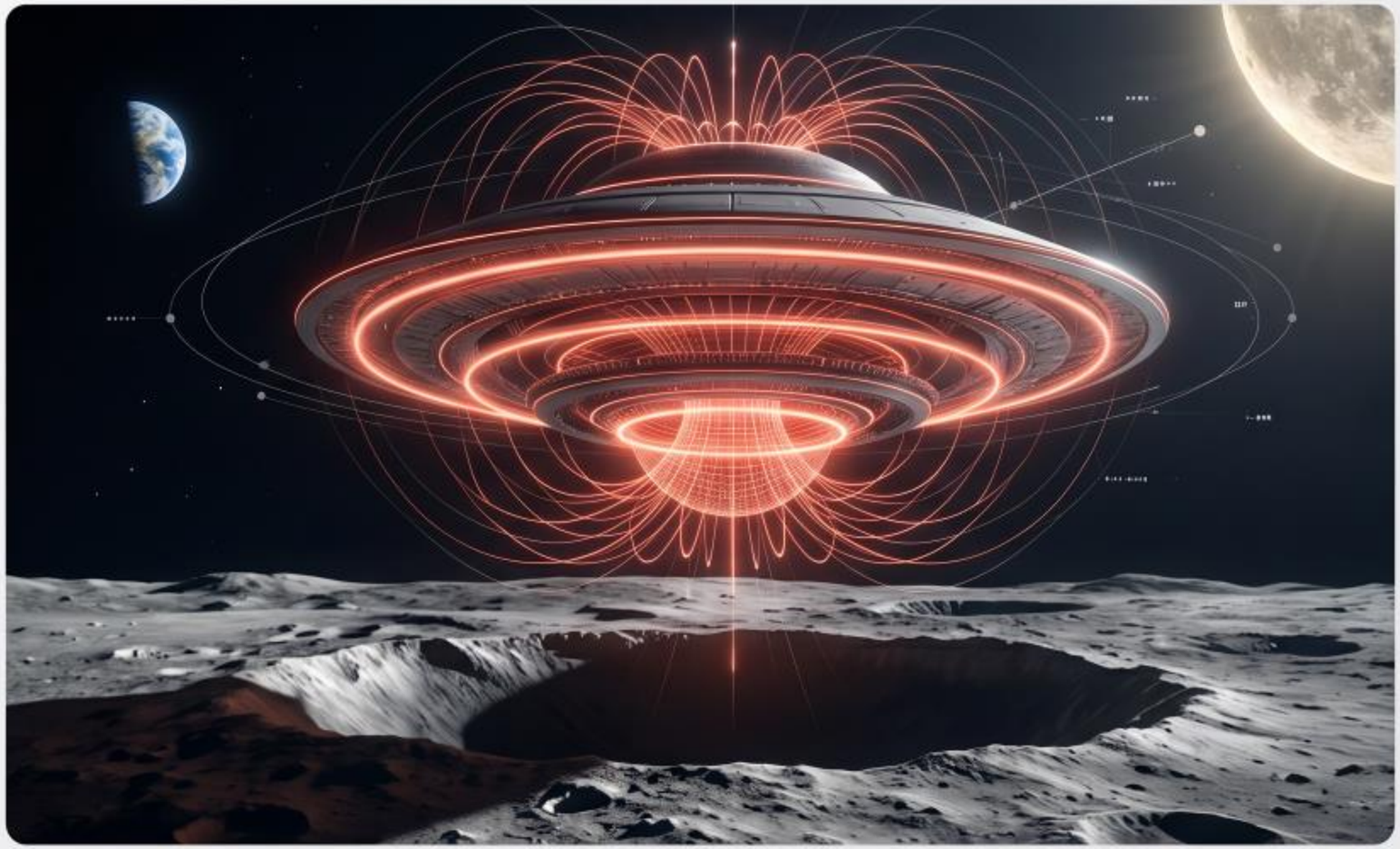
nashmarkAI NAV

Equilibrium-Governed Navigation. No Fuel. Pure Resonance.



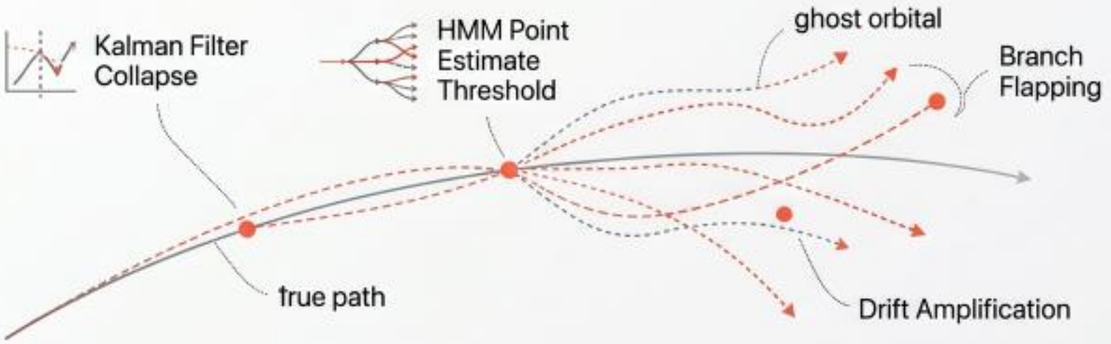
nashmarkAI
NAV

Lost in the Void

Firstared fractured orbie / nam· fractured ghost orbital paths.

VISUAL METAPHOR 1

Conventional Estimator Failure

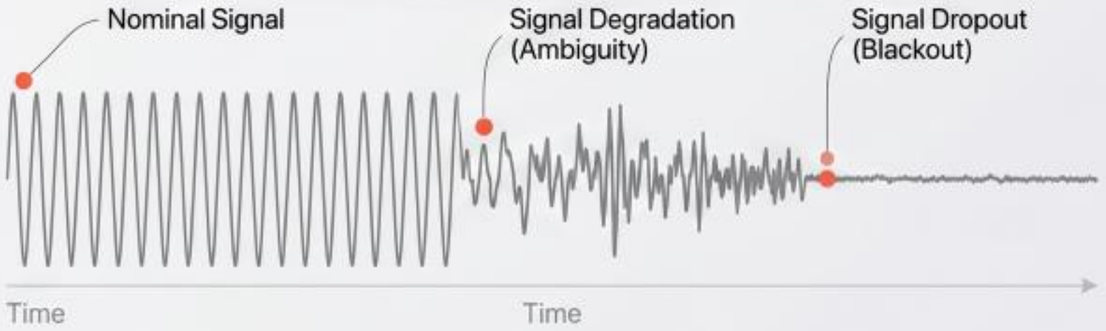


Conventional estimators collapse to point estimates when observations degrade, causing continuity rupture.

Navigation failure comes from false structural commitment under incomplete evidence. Hallucinating a wrong path.

VISUAL METAPHOR 2

Deep-Space Transit & Signal Blackout



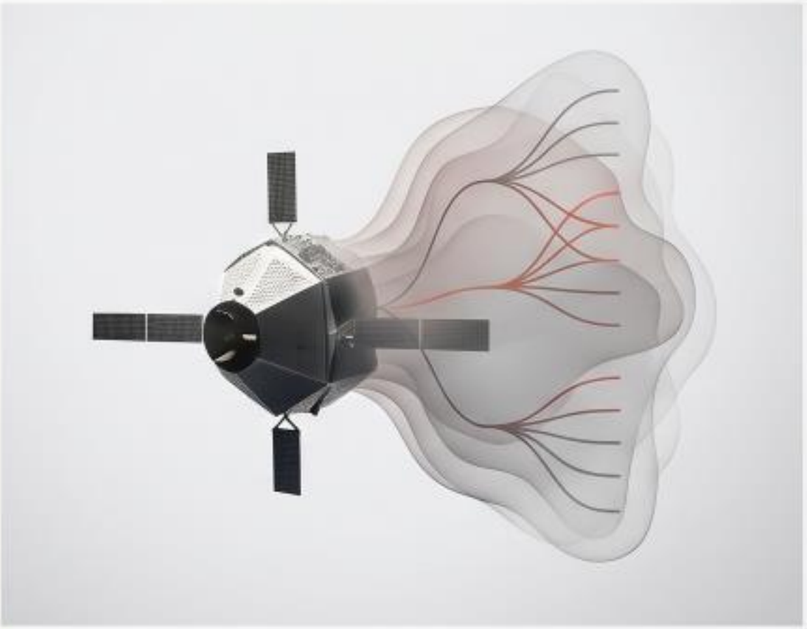
NashMark AI NAV: Continuity Preservation > Coordinate Chasing

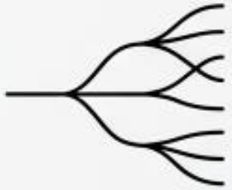
Three Navigation Paradigms

Kalman Filtering

- Labeled-Route Tracking
- Raw Position Sharpness
- Benign Noise

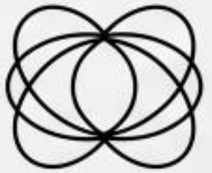
Hidden Markov Models





- Discrete Branch-State Interpretation
- Stable Rooted Labels

NashMark AI NAV



- Equilibrium Governance
- Coherent Traversal
- Ambiguity & Distortion Resistant

Continuity Is King ∫

FOUNDATIONAL PREMISE:
Navigation is not point estimation—it is the **preservation of law ful traversal** under **uncertainty.**

NashMark Equilibrium Principle:

Δ_t = Net Traversal Imbalance = 0

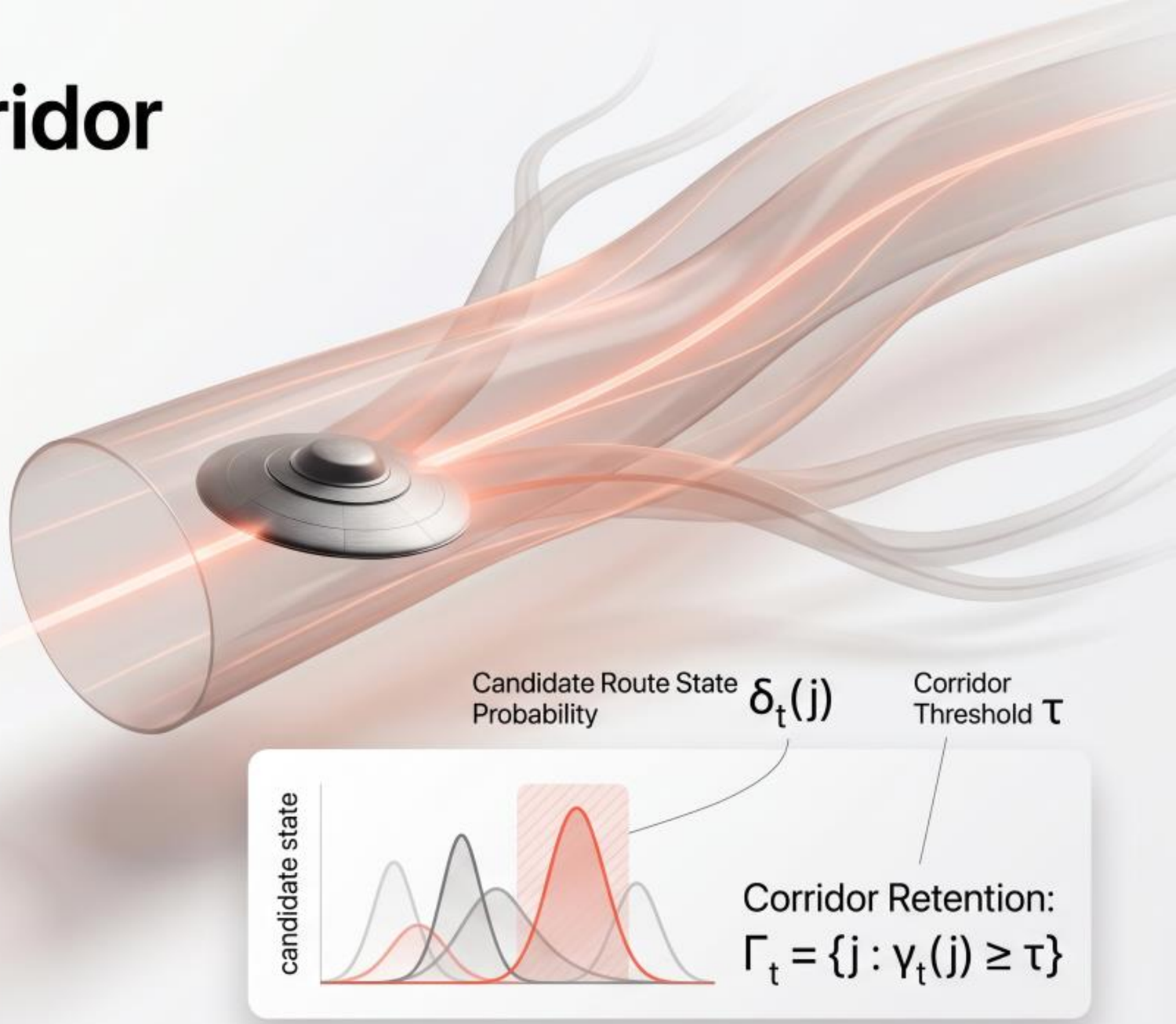
DESTABILISING LOAD:
- Observation Drift
- Ambiguity
- Structural Inconsistency
- Breach Pressure

STABILISING STRUCTURE:
- State Coherence
- Governance Stability
- Route Continuity
- Restoration Potential

The Trajectory Corridor

NashMark avoids premature branch collapse by retaining a probabilistic corridor of plausible traversal states.

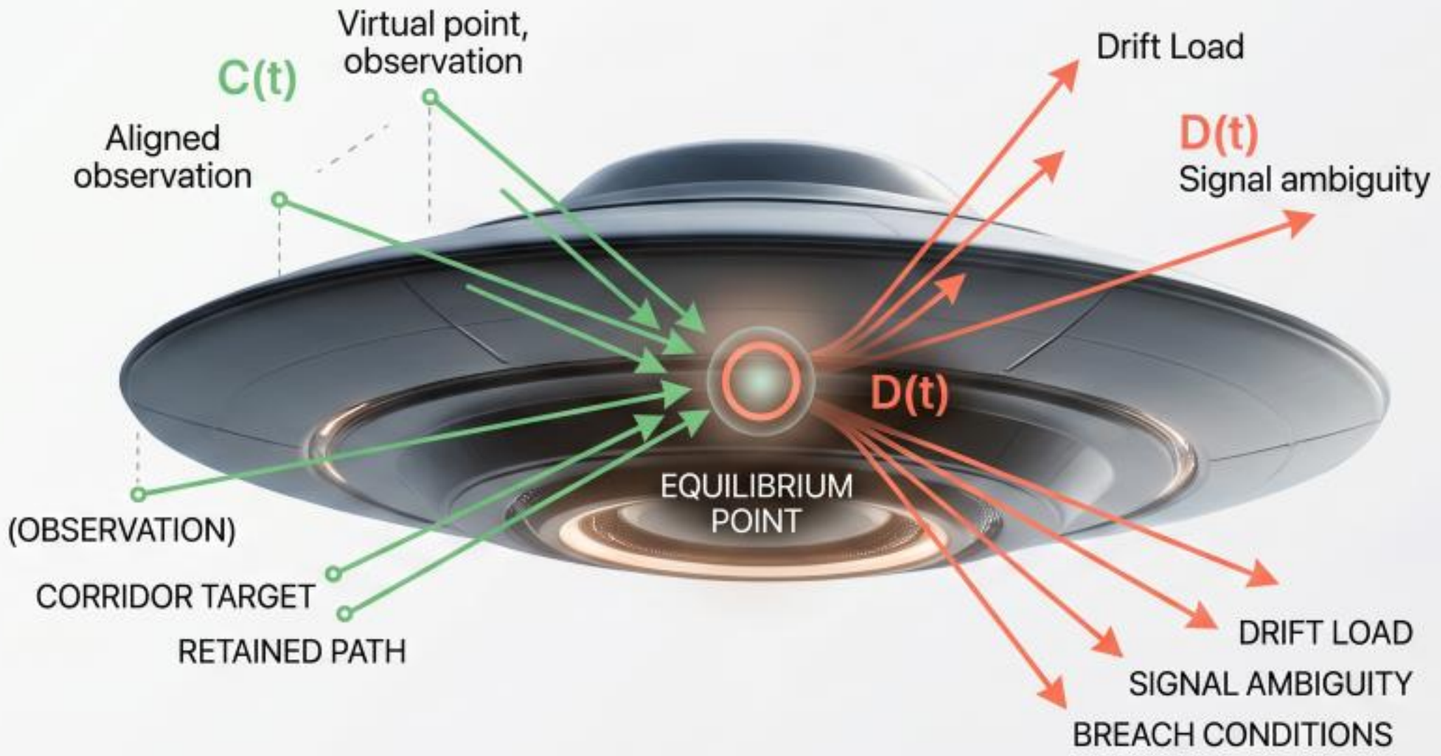
Structured ambiguity is preserved under degraded observation, ensuring traversally coherent navigation.



Equilibrium Thrusters — MSS

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

THE INTERNAL COHERENCE RATIO



COMPONENT KEY			OPERATIONAL MODES	
C(t) (COOPERATIVE MASS)	Alignment of Obs, Target, Path Retention		MSS ≥ 0.75	SAFE COMMITMENT & AGGRESSIVE RESTORATION
D(t) (DEFECTION MASS)	Divergence from Signals, Drift, Breach		MSS < 0.75	CONSERVATIVE HOLD MODE (Defer transitions)

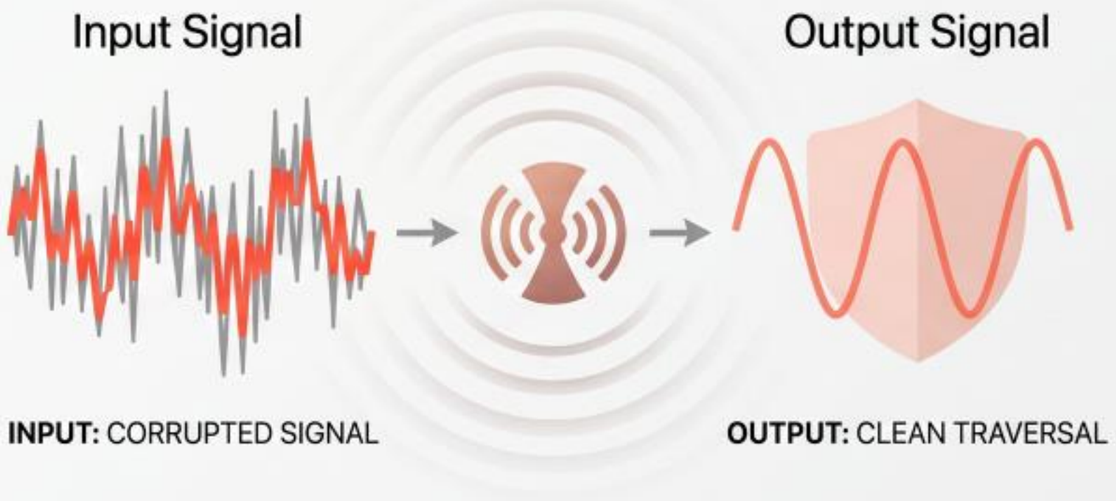
Signal Restoration — R(t)

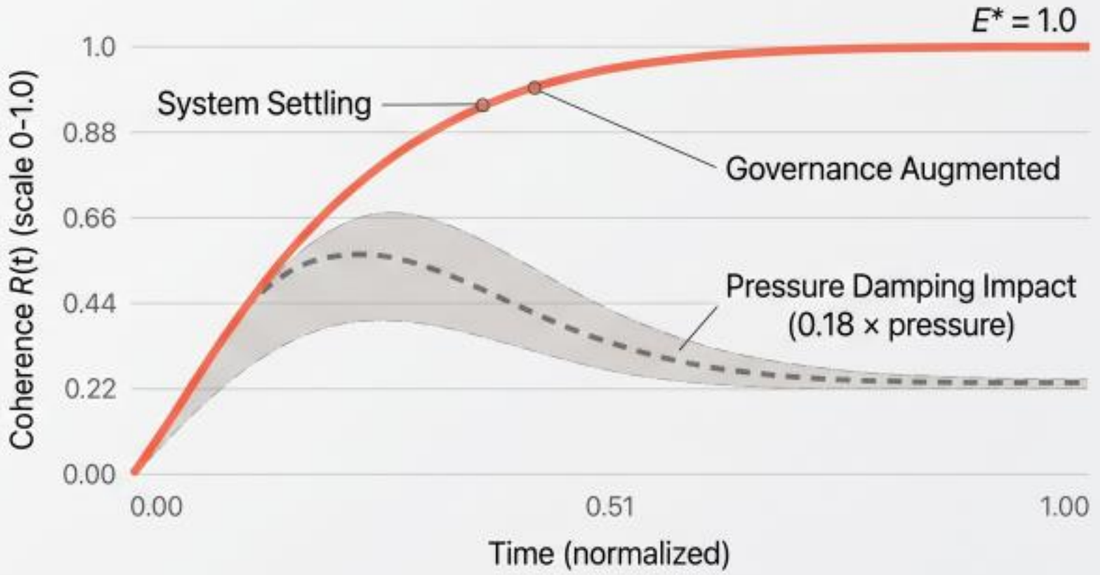
$$R(t) = E^* - e^{-kt}$$

E* is Equilibrium Coherence Target (1.0)

k is Recovery Rate Constant (1/20,000 per step), modulated by live pressure signals

- **Regenerative Shield**: Capacity to restore coherent traversal after degradation events.
  - Increased with policy consensus and governance stability.
- **Pressure Damping:** *R*(*t*) damped by 0.18 × pressure, preventing premature confidence.
- **Self-Restoration Trust**: High *R*(t) increases target gain and recovery pull.
  - The craft knows it can trust its own restoration capacity.





Blackout Decay — $D_h(t)$

Model of Residual Decay Pressure

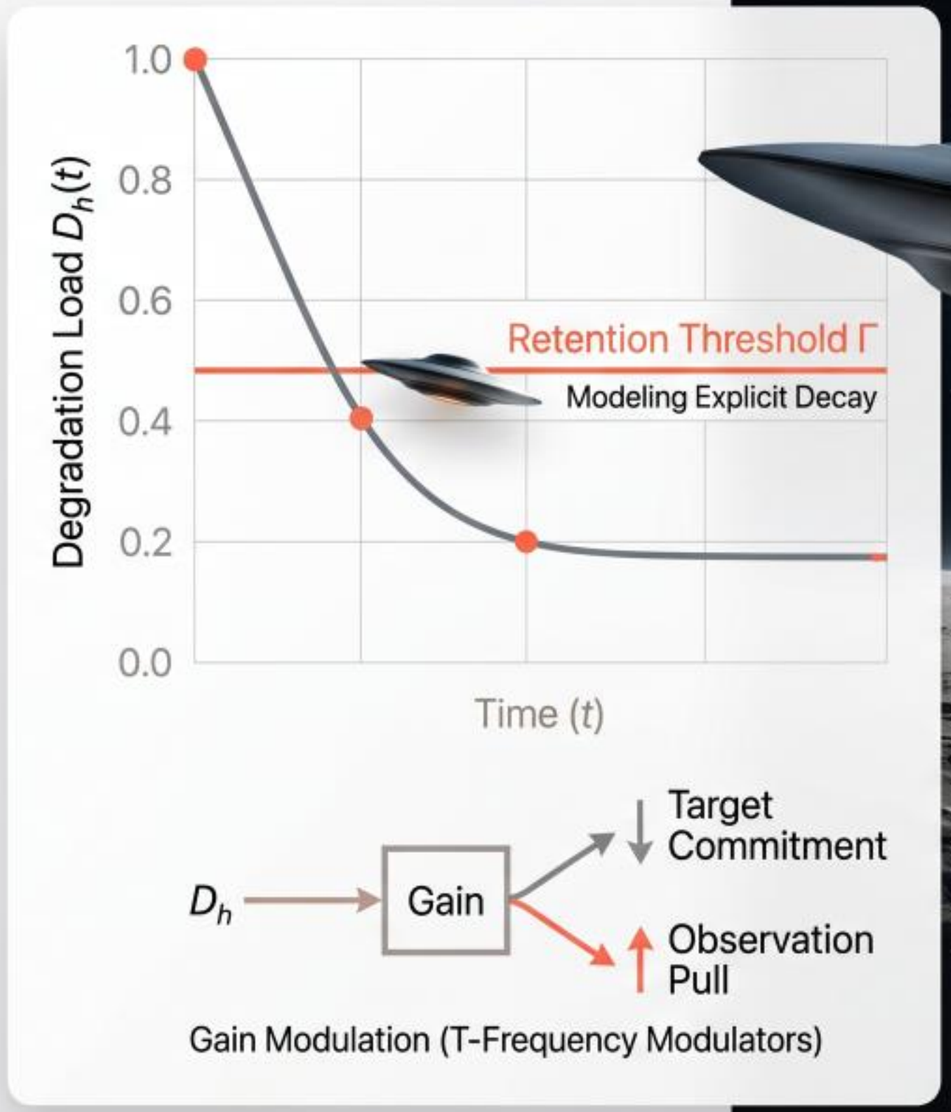
$D_h(t)$ explicitly models accumulated uncertainty from signal loss, ambiguity, or sustained blackout. This "damage-aware armor" prevents panic.

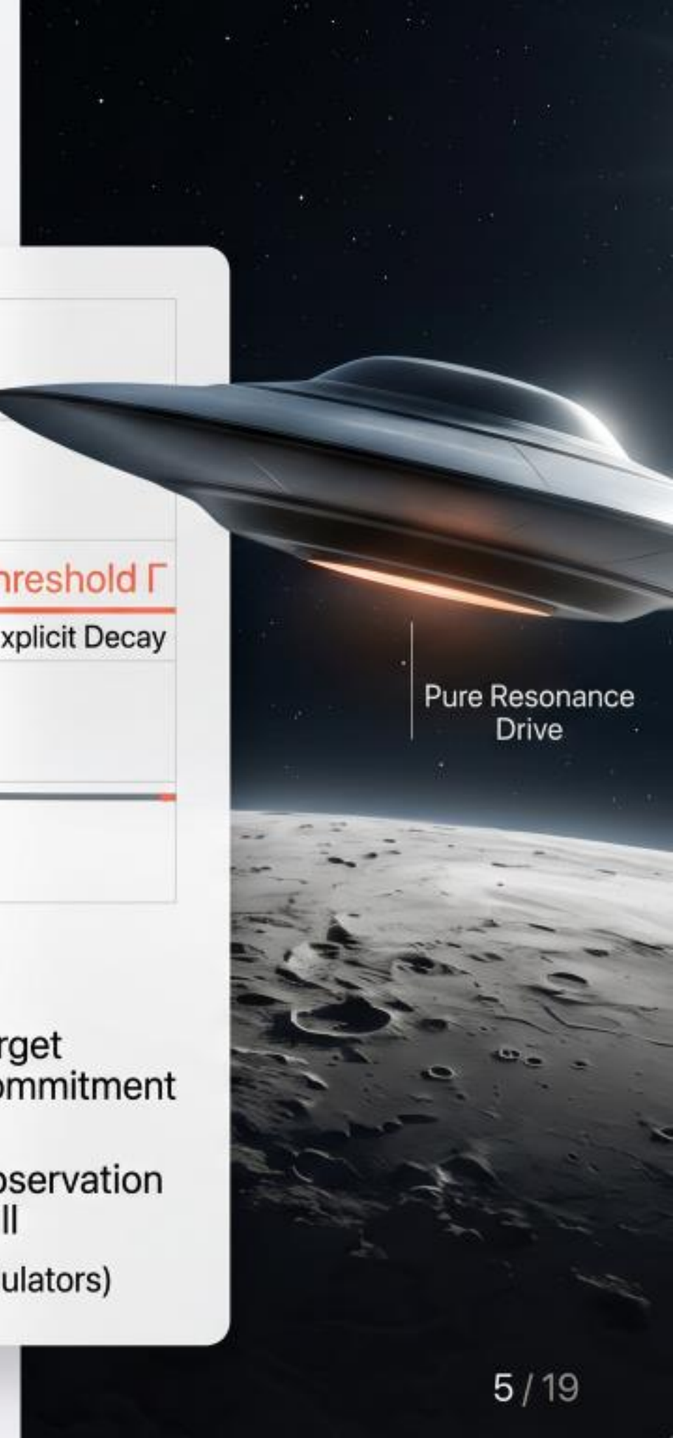
$$D_h(t) = D_0 e^{-\lambda t}$$

Parameters:

- $D_0 = 1.0$ (Initial Load)
- $\lambda = 1/40000$ (Decay Constant)
- Increases by 0.28 × pressure.

Direct Modulation: High degradation reduces target commitment and increases obsevation pull for cautious navigation.





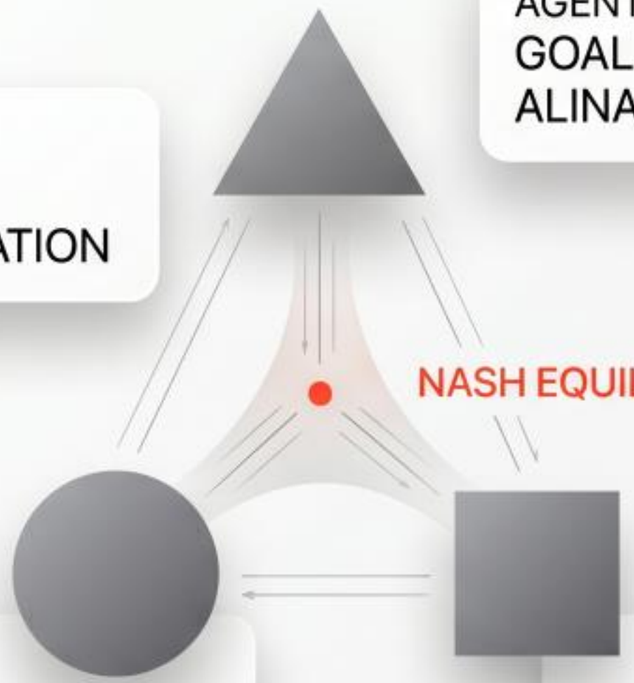
The Navigation Council

GOVERNANCE STABILITY G(t)

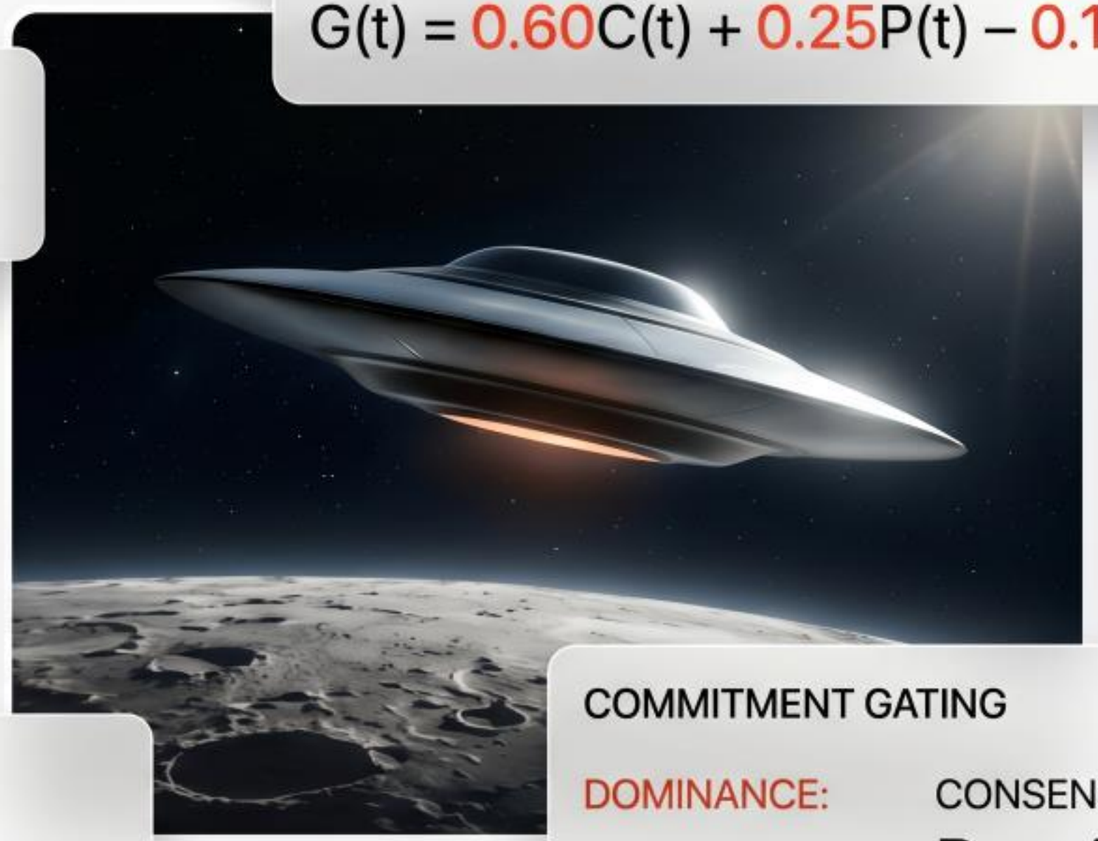
$$G(t) = 0.60\bar{C}(t) + 0.25P(t) - 0.15V(t)$$

AGENT 1:
PATH
OPTIMIZATION

AGENT 3:
GOAL
ALINAGEMENT



NASH EQUILIBRIUM



AGENT 2:
RISK MANAGEMENT

AGENT 3:
GOAL ALIGNMENT

COMMITMENT GATING

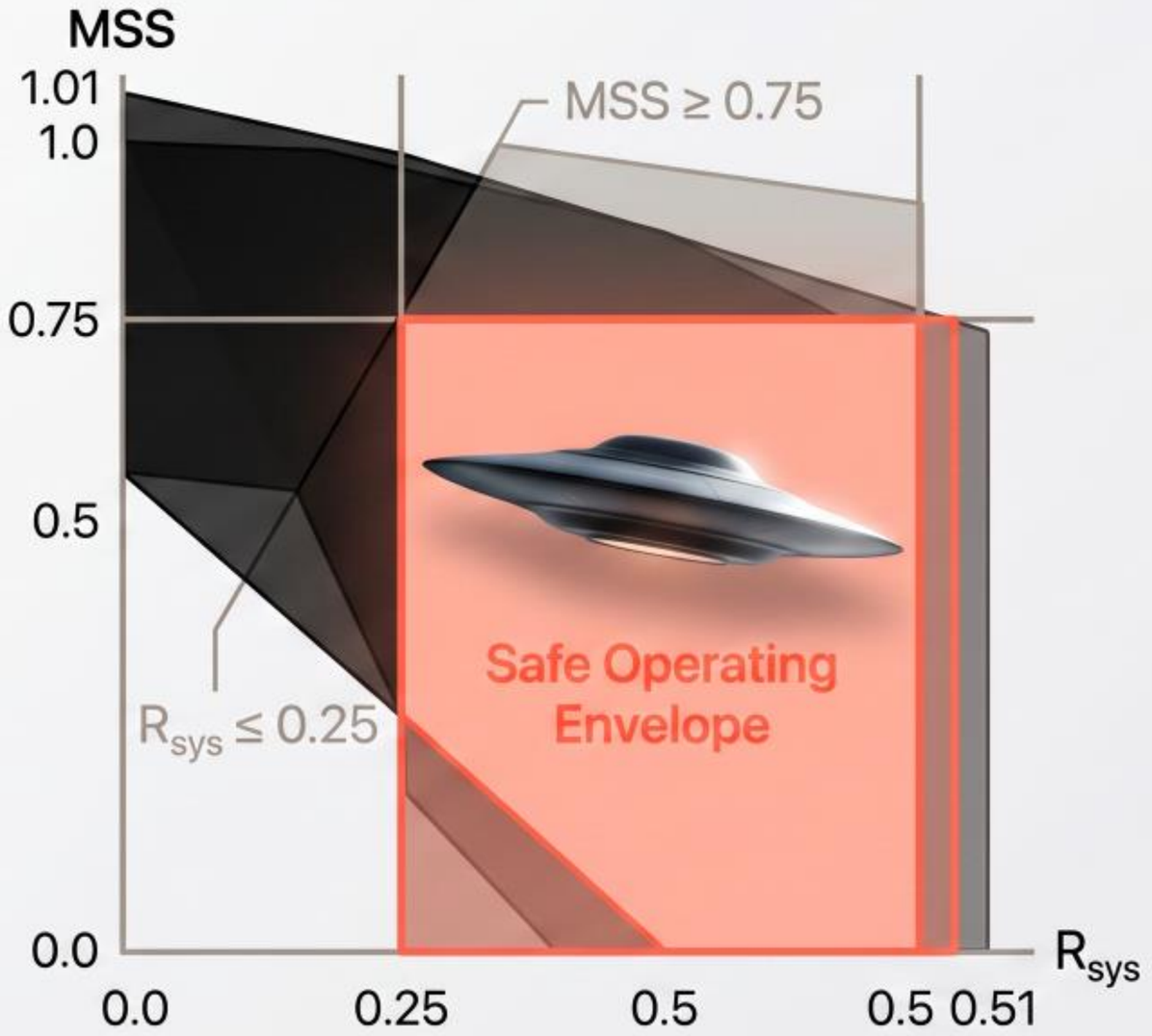
DOMINANCE:
Alone Insufficient

CONSENSUS:
Required

Safe Operating Envelope

Hard Boundary Governance

- Moral & Structural Stability (**MSS(t)**): Must exceed **0.75**.
- Systemic Risk (**$R_{sys}(t)$**): Must remain below **0.25**.
  $R_{sys} = w_d \times d(t) + w_v \times V(t)$
- Actions: Gain correction (+0.10) inside; Commit deferred outside via temporal gating.

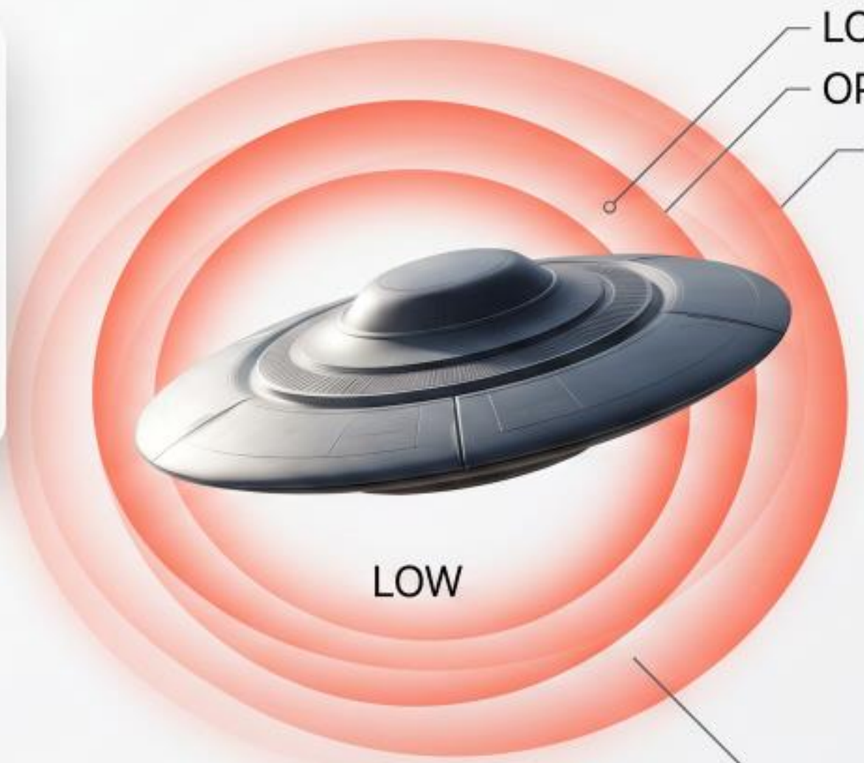


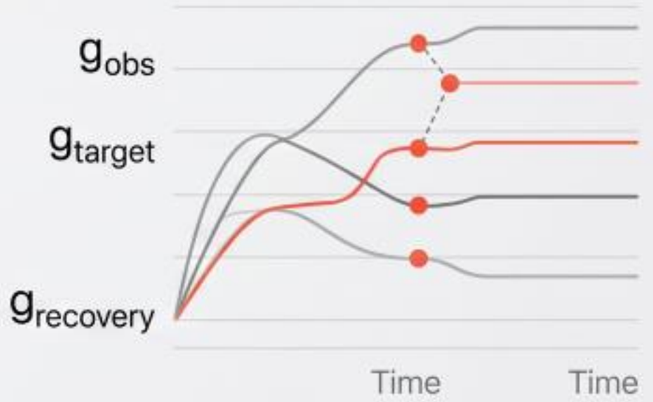
T-Frequency Modulators

T-FREQUENCY GAINS
(Action-Conditioned)

Action	Observation	Target	Recovery
COOPERATE	0.16	0.44	0.18
HOLD	0.20	0.30	0.12
DEFECT	0.24	0.18	0.08

Dynamic gain modulation adjusts observation, target, and recovery pulls in real-time based on action, context, and conditions.

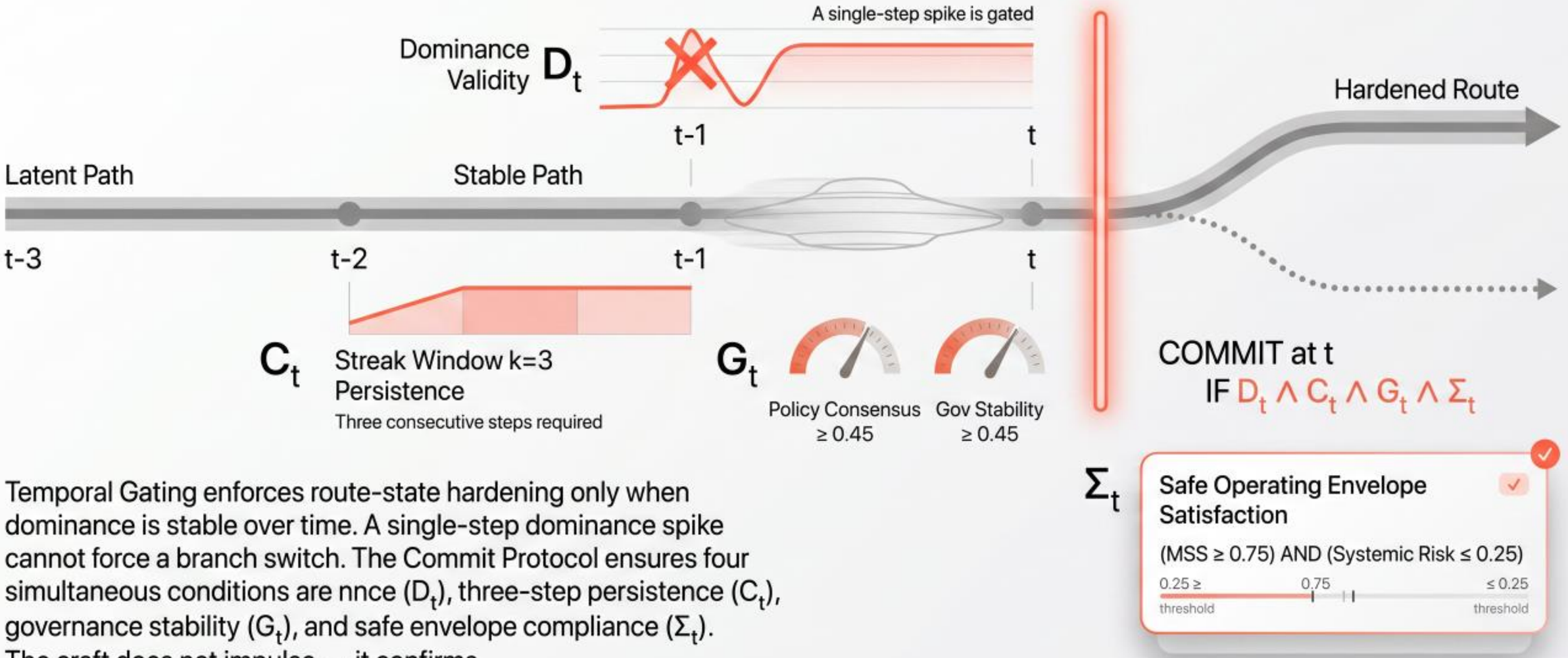




K(t) Modulation Matrix

$$x_{t+1} = x_t + [g_{obs}(z_t - x_t) + g_{target}(\hat{x}_t - x_t) + g_{recovery}(\tilde{x}_t - x_t))]$$

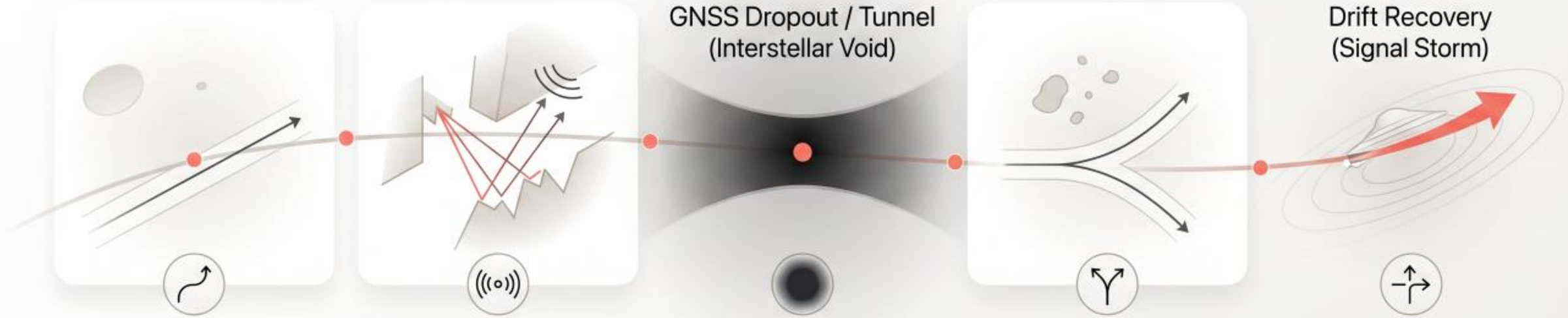
Commit Protocol — Temporal Gating



Temporal Gating enforces route-state hardening only when dominance is stable over time. A single-step dominance spike cannot force a branch switch. The Commit Protocol ensures four simultaneous conditions are nnce (D_t), three-step persistence (C_t), governance stability (G_t), and safe envelope compliance (Σ_t). The craft does not impulse — it confirms.

5 Mission Zones

Progressively Harder Conditions



1 Clear Route (Lunar Far Side)

Benign Noise. Baseline Tracking (σ=1.2)

2 Urban Canyon (Planetary Shadow)

Multipath Distortion. structured bias, elevated noise (σ=2.0)

3 GNSS Dropout / Tunnel (Interstellar Void)

Pure Blackout. Complete signal null (steps 24-42)

4 Ambiguous Junction (Asteroid Belt)

False-Branch Resistance. Fork distortion (vertical bias, σ=2.6)

5 Drift Recovery (Signal Storm)

Restoration Capacity. Large systematic drift, severe displacement

Mission Telemetry

Comprehensive Performance Benchmarks vs Baseline Systems

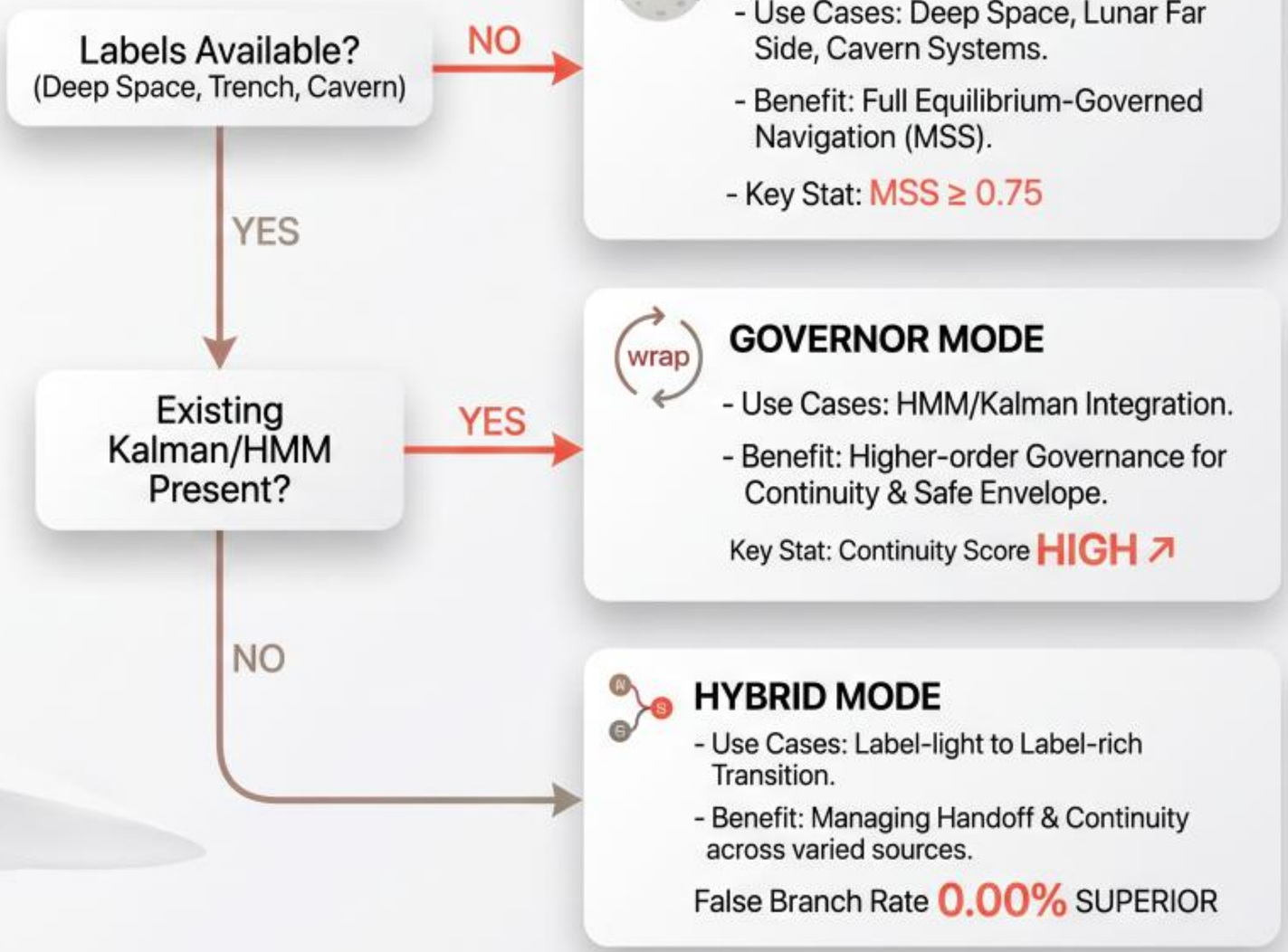
SCENARIO	SYSTEM	MEAN ERROR (lower is better)	CONTINUITY SCORE (higher is better, max 1.0000)
Clean Route	NashMark	0.06	1.0000
Urban Canyon	NashMark	2.43	0.8769
GNSS Dropout	NashMark	2.33	0.8701
Ambiguous Junction	NashMark	3.08	0.8769 FALSE BRANCH RATE **0.00%**
Drift Recovery	NashMark	1.84	1.0000

NashMark AI dominates ambiguity, blackout, and drift conditions, maintaining superior continuity in all degraded scenarios.

Select Navigation Mode

NashMark AI NAV functions as a modular navigation architecture, offering three precise operational nal modes tailored tailored to environmental conditions and infrastructure availability.

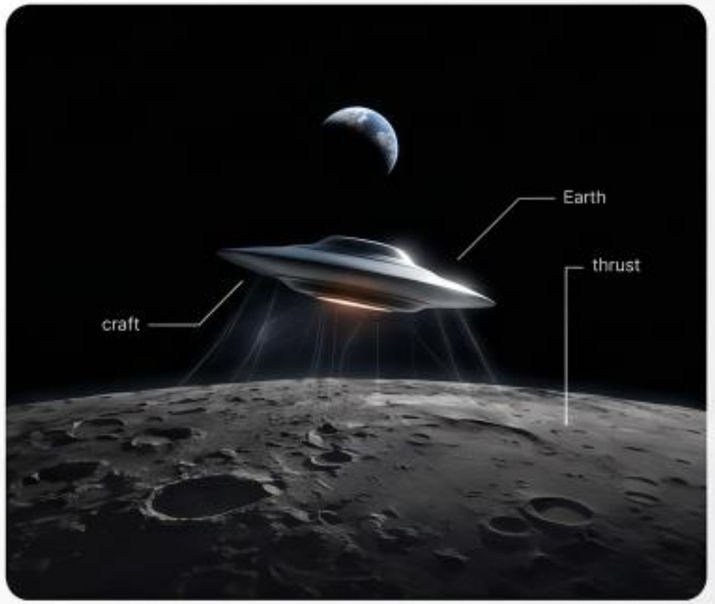
T-FREQUEN
(obs, target, recovery)



Deep Space Frontiers

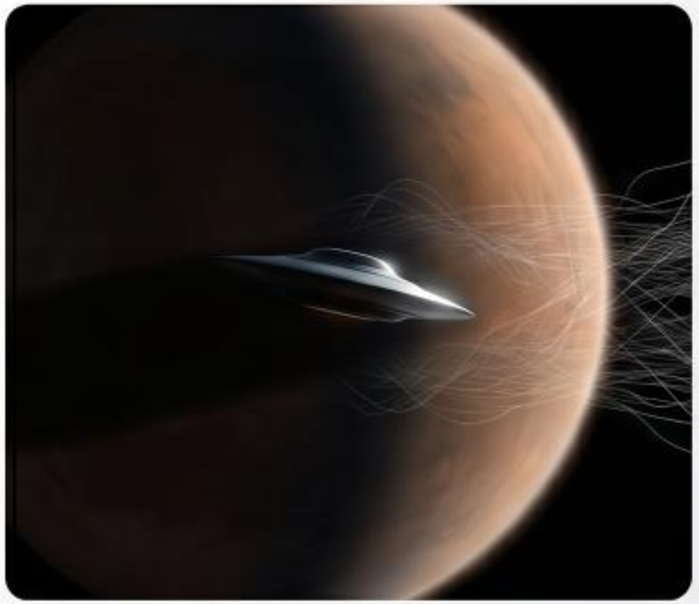
Achieving propulsionless transfer through state alignment with the cosmic web, NashMark AI navigates where systems fail. Connection precedes division. Potential is activatable. Navigation is the management of resonance and alignment.

1. LUNAR FAR SIDE



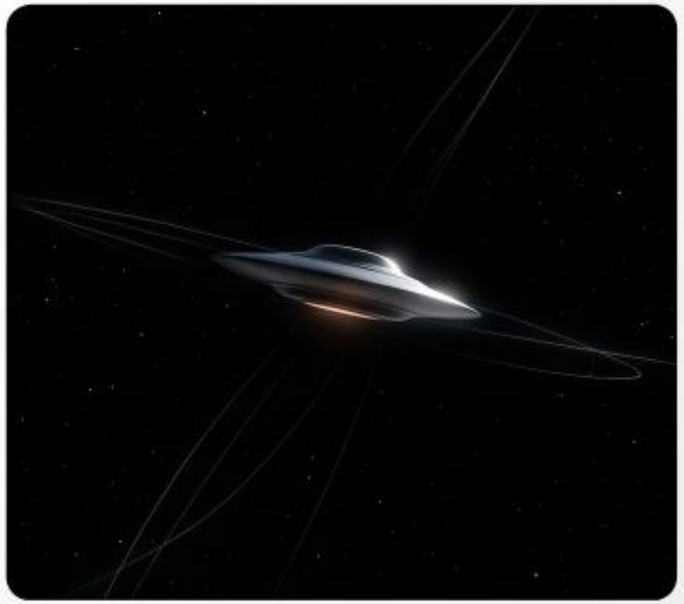
PERMANENT GNSS BLACKOUT.
Autonomous continuity preservation through equilibrium corridors.

2. PLANETARY SHADOW



OCCULTATION-INDUCED SIGNAL DEGRADATION.
Ambiguity-managed traversal with temporal commit gating.

3. INTERSTELLAR VOID



SPARSE REFERENCE OPPORTUNITIES.
Communication lag measured in hours. Drift recovery and restoration dynamics.

Classification: Protected

Public Disclosure Includes

- Mathematical framing of equilibrium-governed navigation.
- Latent path inference & corridor retention mechanics.
- Benchmark structure, scenario logic, and metrics suite.
- Comparative results & route-graph demonstration.

Protected Internals Include

- Full equilibrium refinement routines.
- Proprietary threshold schedules & tolerances.
- Exact governance weighting & agent tuning parameters.
- Sovereign control core & protected restoration logic.

The benchmark shell demonstrates architecture and results without exposing the governing engine.

Equilibrium Maintained

- **NashMark AI NAV:** established benchmark for ambiguity-sensitive continuity and drift recovery.
- Validated in degraded, label-light conditions where continuity preservation is paramount over coordinate chasing.

Riding resonant strands through the cosmic web. No fuel. Pure equilibrium.

Truth = Eq(S)

nashmarkAI
NAV

EQUILIBRIUM-GOVERNED
NAVIGATION. NO FUEL.
PURE RESONANCE.