

# Autonomous Agent Fleet Health Through Coherence Diagnostics

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Monitoring individual agents in a fleet catches individual failures. It does not catch fleet-level coherence deterioration: the gradual degradation in inter-agent coordination, decision consistency, and collective behavioral quality that precedes cascading failures. Disruption modeling applied to autonomous agent fleets provides coherence diagnostics that detect fleet-level disruption patterns, semantic starvation between agents, and collective phase shifts before they manifest as operational failures.

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## The fleet coherence problem

A fleet of one thousand customer service agents, or a fleet of autonomous delivery robots, or a fleet of trading algorithms all share a pattern: individual agents pass their health checks while the fleet's collective behavior deteriorates. Agent A and Agent B are each individually functional, but their

interactions produce outcomes that neither would produce alone. The fleet has a coherence problem that individual monitoring cannot detect.

Fleet-level issues include: coordination degradation where agents increasingly duplicate or conflict with each other's work, semantic drift where agents gradually interpret shared concepts differently, and load-induced brittleness where fleet performance degrades non-linearly under stress. Each agent's individual metrics look acceptable. The fleet's collective behavior is deteriorating.

## Why aggregate metrics miss fleet coherence problems

Fleet monitoring typically aggregates individual metrics: average response time, total throughput, error rate. These aggregates can mask coherence problems. Average response time may be stable while response time variance increases dramatically. Total throughput may be maintained while agents increasingly duplicate each other's work. Error rate may be low while the types of errors indicate systematic coherence deterioration.

## How disruption modeling addresses this

Disruption modeling applied to agent fleets treats the fleet as a cognitive system with its own coherence dynamics. The fleet has a collective promotion-containment state: in promoted mode, agents coordinate flexibly and adapt to changing conditions. In contained mode, agents become rigid, follow narrow behavioral patterns, and lose adaptive capacity.

Phase-shift detection at the fleet level identifies transitions from promoted to contained fleet behavior. A fleet under increasing load may shift from flexible coordination to rigid task execution, losing the adaptive capacity that handles novel situations. This phase shift is detectable through disruption modeling before it manifests as operational failure.

Semantic starvation diagnosis detects when agents are receiving insufficient information from each other to maintain coordinated behavior. An agent that increasingly makes decisions without adequate context from peer agents is semantically starved. The fleet's collective decision quality degrades as starvation spreads.

Group coherence tracking monitors the alignment between agents' internal states, their interactions, and their collective outcomes. A fleet where agents' internal models are diverging from each other has declining group coherence, even if each individual agent's internal model is self-consistent.

Early warning indicators from the five-axis diagnostic framework, adapted for fleet context, provide actionable alerts: attention fragmentation across the fleet, containment collapse in specific agent subgroups, or channel-locked promotion where the fleet over-relies on a single coordination strategy.

## What implementation looks like

A fleet operator deploying coherence diagnostics adds a fleet-level disruption model alongside individual agent monitoring. The model evaluates collective coherence metrics computed from inter-agent interactions, coordination patterns, and collective behavioral trajectories.

For AI platform companies running thousands of customer-facing agents, fleet coherence diagnostics detect when model updates, configuration changes, or load increases cause fleet-level behavioral degradation that individual agent metrics miss.

For autonomous vehicle fleet operators, coherence diagnostics detect when environmental conditions, mapping data staleness, or software updates cause fleet-level coordination deterioration, enabling preemptive interventions before degraded coordination produces safety incidents.

Disruption Modeling All 21 steps →

Recognize cognitive disruption before it stabilizes.

Primary Technical Disclosure
○ AQ-DSM: Diagnosing Cognitive Disruption as Loss of Coherence
Secondary Technical
○ Cognitive Disruption as Architectural Phase-Shift○ The Promotion-Containment Continuum○ Attention Fragmentation: Reward-Biased Over-Promotion of Speculative Branches○ Containment Collapse: Loss of the Speculation-Verification Boundary○ Channel-Locked Promotion With Tolerance Escalation○ Five-Axis Disruption Diagnostic Framework○ Computable Therapeutic Dosing for Cognitive Disruption○ Intergenerational Coherence Burden in Agent Lineages○ Agent Self-Diagnosis and Autonomous Coherence Monitoring○ Phase-Shift Early Warning System for Cognitive Disruption○ Coherence Restoration Protocol Library○ Positive and Negative Symptom Analogs in Containment Failure○ Coherence Authorization Failure: Self-Disabling Execution○ Pathological Verification Loop: Recursive Containment Audit Failure○ Dissociation as Simulation Bypass: Acting on Unverified Planning○ Affective Gradient Collapse: Self-Esteem Floor Lock○ Resilience as Structural Capacity for Coherence Restoration○ Personality Configuration Analogs From Stabilized Coping Regimes○ Structural Dependency Patterns Between Agents○ Destabilizing Attachment: Mutual Disruption Amplification○ Resource-Depletion Pattern: Cognitive Operation Under Scarcity○ Therapeutic Agent Interaction Through Behavioral State Recognition○ Companion AI Relational Safety Constraints○ Multi-Agent Group Coherence Dynamics
Applications (General)
○ Coping Under Empathic Pressure: HSP, Narcissism, and Psychopathy as Control-Loop Intercepts○ Two Faces of Codependency: Structural Entrapment vs. Emotional Entrapment Under Empathic Pressure○ Starving for Each Other: Anxious–Avoidant Attachment as a Semantic Starvation Loop○ Intimacy Collapse: A Structural Model of Trauma and Resilience○ Structural Diagnosis: How Reward-Modulated Cognition Phase-Shifts Into ADHD and Schizophrenia○ Clinical AI Therapeutic Monitoring Through Phase-Shift Detection● Autonomous Agent Fleet Health Through Coherence Diagnostics○ Disruption Modeling for Workplace Burnout Detection○ Disruption Modeling for Military Operator Resilience○ Disruption Modeling for Financial Trader Monitoring○ Disruption Modeling for Student Mental Health○ Disruption Modeling for Caregiver Fatigue Detection○ Disruption Modeling for First Responder Resilience
Applications (Specific)
○ BetterHelp Cannot Detect When Therapy Is Making Things Worse○ Talkspace Has No Model of Therapeutic Destabilization○ Headspace Cannot Detect When Mindfulness Destabilizes○ Noom Tracks Behavior Without Modeling Cognitive Disruption○ Spring Health Matches Therapists, Not Disruption Patterns○ Lyra Health Measures Outcomes, Not Coherence Trajectories○ Ginger.io Detects Behavioral Signals Without a Disruption Model○ Cerebral Prescribes Medication Without Modeling Disruption Dynamics○ Modern Health Offers a Care Spectrum Without Disruption Diagnostics○ Calm Business Offers Relaxation, Not Disruption Detection

Disruption Modeling overview →
AQ
deterministic
autonomy

Legal

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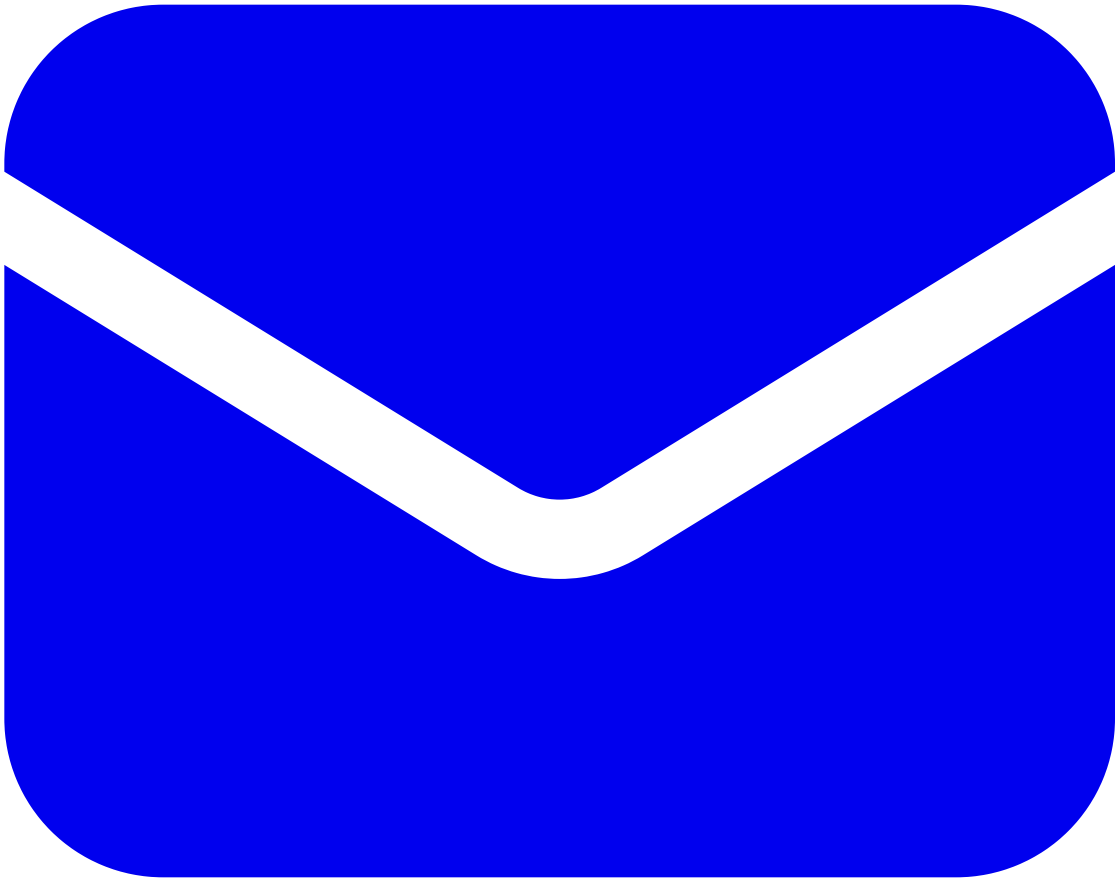


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