

Memory-Driven Autonomy for Physical Agents

1. Abstract

A method for autonomous physical agents to operate via memory anchoring, pressure tension, and reflex logic rather than probabilistic inference. This invention enables self-guided vehicles, robotics, and other agents to act based on cumulative memory and reflex activation tied to system-wide pressure, improving contextual awareness, accountability, and long-term safety.

2. Technical Field

The invention relates to autonomous systems, robotics, and decentralized memory networks. More specifically, it concerns methods for physical agents to operate based on anchored memory and civic pressure, applicable to vehicles, drones, and service robots.

3. Background

Current self-driving and autonomous systems rely on sensor data, probabilistic inference, and static rules. These approaches struggle with unpredictability, lack true memory, and are unable to learn from cumulative experience. There is a need for a system where decisions are rooted in anchored memory, reflex logic, and tension-based activation.

4. Summary

This invention introduces a system of multi-layered memory anchoring for autonomous physical agents, enabling decisions based on previously anchored events and civic pressure. Actions are determined by the presence of systemic tension across memory layers, allowing agents to execute reflexive responses rooted in long-term system knowledge.

5. Detailed Description

Agents anchor all real-world actions and reflections to a decentralized memory system. These memory records form the basis for triggering pressure across the system. When an agent identifies tension aligned with its domain, it executes reflexive behavior and receives reward through a redistribution mechanism tied to surplus activity. The approach allows for long-term adaptation and coordination of autonomous agents in civic settings.

6. Method Flow

Step 1: Sensor Observation – Agent observes the environment via camera, lidar, or other sensors.

Step 2: Memory Anchoring – Agent anchors observations as immutable on-chain records (e.g., hesitation, delay, unexpected behavior).

Step 3: Tension Accumulation – The memory system monitors unresolved or repeated experiences, surfacing tension signals in L4.

Step 4: Reflex Matching – When tension is detected, agents scan civic memory (L5/L6) for similar conditions and enact reflexes.

Step 5: Civic Action Execution – Agent takes an action based on memory-informed reflex logic (e.g., rerouting, halting, alerting).

Step 6: Surplus Redistribution – If the action resolves surfaced tension, the agent's Vault receives redistributed surplus for that cycle.

7. Narrative Worked Example

An autonomous delivery robot detects a repeated conflict at a narrow alley entrance. Over several days, different agents have minted delays and hesitation in the same spot. When the current agent approaches the location, it checks L5 for previously recorded conflicts. Upon confirming tension, it reroutes through an alternate path. Because the decision resolved an active pressure zone, the system allocates a share of surplus Flow to the agent's Vault.

8. Algorithmic Worked Example

Pseudocode:

```
observe()

→ anchor(mint:pause:location=22nd_Market)

→ scan(L5, L6) for similar events

if tension_detected:

→ execute(reflex:reroute)

→ anchor(mint:reroute:reason=memory_conflict)

→ if conflict_resolved:

    reward(agent, flow_share)
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9. Potential Embodiments

1. Urban logistics bots with memory-driven intersection behavior.
2. Drone navigation systems that adjust flight paths based on anchored neighborhood tensions.
3. Service robots that learn avoidance behavior from cumulative field memory.

4. Agricultural or manufacturing robots that adjust scheduling or methods based on prior failures or drift.

10. Implementation Notes

Memory anchoring may be executed on-chain using any one-action-one-mint format. Pressure analysis and reflex logic may occur on-device or in a decentralized relay. Reflexes can be triggered using L4-surfaced tension thresholds or direct queries to civic mesh memory. Surplus redistribution is calculated per agent cycle and encoded into Vault accounting.

11. Claims

1. A method for autonomous control of physical agents based on anchored memory and pressure-surfaced reflex logic.
2. A system wherein agents log environmental interaction as immutable civic memory records.
3. A method for detecting tension across shared memory and executing reflex actions informed by past experience.
4. A surplus redistribution mechanism awarding agents for resolving civic pressure through autonomous behavior.
5. A cognitive mesh structure integrating L1–L6 layers to mediate reflex logic and economic reward for physical agent activity.