Lineage-Aware Memory Infrastructure for AI Systems

Semantic memory, retrieval boundaries, deterministic replay, and compression discipline for longitudinal AI infrastructure.

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FRONT MATTER

Abstract

A Bluehand research artifact establishing lineage-aware memory as an infrastructure problem: retrieval is not evidence, compression is not truth, and semantic memory requires auditable transformation context.

Provenance

Source: research/registry.json. HTML route /research/lineage-aware-memory/ remains the canonical indexed surface.

Compile receipt

Generated at 2026-06-13T02:11:50Z by scripts/pdf/generate_encodings.py (engine=reportlab; depth=published_reportlab_projection_v2).

Publication note

Portable PDF encoding of /research/lineage-aware-memory/. HTML is canonical; this file supports sharing, review, archive, and stakeholder packets.

DOCUMENT BODY

Purpose

Orient readers to Bluehand’s memory thesis: durable AI usefulness depends on semantic continuity with visible transformation boundaries.

Problem addressed

AI systems retrieve, summarize, and reuse context without exposing what was preserved, lost, inferred, or merely similar.

Why now

AI systems are moving from isolated chat interactions toward persistent agents, retrieval systems, personal workflows, and institution-facing automation.

Inspiration

SigMem0 and the Bluehand doctrine that retrieval, compression, and clustering are not evidence unless authority and context are declared.

Vision direction

Memory infrastructure that lets people navigate accumulated work without confusing retrieval candidates for proof.

Reader takeaway

Bluehand treats memory as infrastructure for meaning, not just a vector database feature.

Operational thesis

Memory is not merely storage. For AI systems, memory is a transformation chain: conversations, documents, summaries, embeddings, retrieval hits, clusters, and decisions all alter meaning. Bluehand’s memory infrastructure stance requires lineage so that derived context remains visible, contestable, and bounded.

Why it matters

Longitudinal AI systems fail when they treat retrieval as truth or compression as evidence. A recruiter evaluating serious AI infrastructure should see that Bluehand distinguishes semantic recall from evidentiary proof, and that memory usefulness depends on auditability as much as relevance.

Governance boundary

This artifact positions lineage-aware memory as a technical and ethical architecture. It should not be read as claiming that every memory mechanism described is deployed across Bluehand systems; implementation status belongs in system-level pages and repo evidence.

Recruiter relevance

Provides a capability signal for AI infrastructure, governance, semantic systems, agentic workflow, or local-first execution roles.

Grant relevance

Supports public-interest framing where responsible AI, trustworthy infrastructure, human-centered systems, or research-to-venture pathways matter.

Partner relevance

Helps potential partners understand the problem Bluehand is orienting around and where collaboration could fit.

Technical reviewer relevance

Surfaces the relevant problem, methods, constraints, failure modes, and implementation boundaries without requiring internal Bluehand context.

Maturity note

Published PDF; HTML should emphasize lineage, retrieval boundaries, and memory governance.

Uncertainty boundaries

Summaries, embeddings, retrieval projections, and rendered pages are not evidentiary authority without declared lineage to source artifacts. Implementation claims require separate evidence.

Public claims

- Bluehand researches semantic memory systems that distinguish retrieval from evidence.

Uncertain claims

- The exact public implementation surface for SigMem0 is not represented by this page alone.

Implementation boundary

This is a public Research Object. Implementation evidence, strict lineage, and runtime proof belong in project/repo-specific surfaces unless explicitly linked.

Publication doctrine

The PDF is the shareable artifact, but the HTML route is the authority surface. It gives crawlers context, gives recruiters a readable summary, and gives Bluehand a stable research landing page that can rank for the work rather than the file format.

PUBLICATION APPENDIX

Source registry

Canonical registry object: research/registry.json (BH-RL-2026-0003). Public discovery: https://www.blue-hand.org/research/registry.public.json

Lineage

id=BH-RL-2026-0003; source=research/registry.json; route=/research/lineage-aware-memory/; engine=reportlab; generated_by=scripts/pdf/generate_encodings.py; pdf_depth_status=published_reportlab_projection_v2

Do not infer

- Do not infer that retrieval hits, summaries, or embeddings are themselves proof.