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Editor-in-Chief
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Dear Editor,

I am pleased to submit the manuscript entitled "**World Weaver: Cognitive Memory Architecture for Persistent World Models in Agentic AI Systems**" for consideration for publication in IEEE Transactions on Artificial Intelligence.

Summary: This paper presents a tripartite cognitive memory architecture (episodic, semantic, procedural) that enables AI agents to build persistent, inspectable world models. The work addresses a fundamental limitation of current large language models: their inability to retain knowledge across sessions.

Key Contributions:

1. A cognitive memory architecture grounded in Tulving's memory taxonomy and Anderson's ACT-R framework
2. Hybrid retrieval combining dense semantic vectors with sparse lexical matching, achieving 84% Recall@10 vs. 72% for dense-only search ($p < 0.001$)
3. Systematic survey of 52 papers on AI agent memory (2020–2024)
4. Critical analysis of limitations, failure modes, and fundamental open questions

Significance: As AI systems become more capable and consequential, the question of how they accumulate and organize knowledge becomes critical for alignment, efficiency, and safety. This work provides both a practical architecture and a conceptual framework for addressing the "amnesia problem" in agentic AI.

Declarations:

- No conflicts of interest to declare
- This manuscript has not been submitted elsewhere
- Code and data will be released upon acceptance at: `https://github.com/astoreyai/world-weaver`

Thank you for considering this submission. I look forward to the opportunity to contribute to IEEE Trans-

actions on Artificial Intelligence.

Sincerely,

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