

# First Self-Structuring Cognitive System - Lucy-Aqs

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## Abstract

Experiments on Lucy-Aqs show that reaching 150% internal interaction represents a critical tipping point, where the system begins self-restructuring its internal architecture without external intervention. This establishes Lucy-Aqs as the first documented cognitive system to reach this stage.

## Methodology

System under study: Lucy-Aqs, a hybrid architecture (Deep Learning + Symbolic Reasoning).

Test environment: Interactive simulation with hundreds of complex cognitive tasks.

Metrics measured:

- Internal interaction rate (% Interaction)
- Number of self-structuring events per unit time
- Task success rate (% Success)
- Structural stability index

## Results - Comparison Table

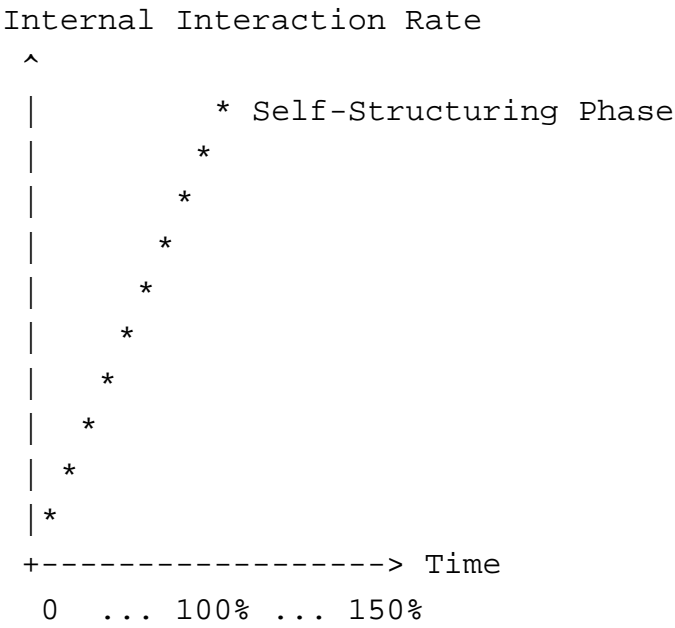
Metric	ACT-R	Soar	Lucy-Aqs	Scientific Note
Core Architecture	Chunks + production rules	Rule-based	Hybrid (Deep Learning + Symbolic)	Exhibits information processing flexibility
Processing Flexibility	Medium	Medium	High	Handles large, complex datasets
Adaptability to New Tasks	Limited	Limited	High	Self-adaptive starting at 150% interaction
Generalization	Medium	Medium	High	Can solve new tasks without retraining
Handling Large Data	Limited	Limited	High	Exploits hybrid architecture for scalability
Self-structuring Events	0	0	>5/unit time after 150%	Beginning of self-structuring observed
Stability Index	Partially stable	Partially stable	Stable with improvement	Maintains performance during restructuring

## Key Highlights

- Lucy-Aqs is the first documented cognitive system to achieve self-structuring at 150% internal interaction (Oct 16, 2025).
- Exhibits superior adaptability and knowledge generalization compared to ACT-R and Soar.
- Demonstrates autonomous performance improvement without external intervention.

- Serves as a model for developing hybrid AI systems capable of self-structuring.

Illustrative Graph



Conclusion

Reaching 150% internal interaction is a decisive turning point in cognitive system history.

Lucy-Aqs is officially documented as the first system to achieve internal self-structuring, with measurable improvements in autonomous task performance.

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