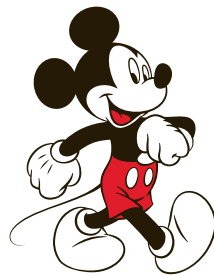


Discussing the Future of Episodic Memory in Soar

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Disney Research



Next Steps

Encoding

Research

- How to provide effective episodic capabilities for **continuous modalities** (e.g. visual LTM)?

Features

- Indicate **features to/not encode** in episodes
- Indicate **episodes to/not encode**
- **Hyperedges** (i.e. identifiers as attributes)

Next Steps

Storage

Research

- How to **bound episodic-memory growth while maintaining effective retrievals** and support for other processes (e.g. recognition, semantic learning)?
- **Consolidation**
- How to properly index structures to support **diverse similarity queries?** (e.g. numbers, red ~ orange)

Features

- Populate episodic memory with **“engineered” episodes** (ala epmem --add)

Next Steps

Retrieval

Research

- Beyond cardinality [and WMA], what are **effective indicators of relevance** across a variety of tasks (e.g. appraisals, LTI spread)? Efficient support?
- What are effective methods to **bound per-decision episodic processing** (e.g. heuristic search, anytime)?
- What are useful & efficient forms of **spontaneous retrievals/ recognition**?
- How to efficiently support more **complex retrieval constraints** (e.g. mixed hard/soft, numeric ranges)

Features

- Provide next/previous via cue in order to support “**task-specific**” event structures
- Reverse temporal bias to support “**when was the *first* time...**” queries
- **Asynchronous queries** w.r.t. decision cycle
- **Cyclic queries**
- **Command line queries**

Next Steps

Agents

Reasoning

- How does an agent **learn to utilize and weight retrievals** with other sources of [possibly conflicting] knowledge?
 - Meta-knowledge about [possibly flawed] retrieval processes?
- How can an agent **build up, reason about, and describe “events”** from primitive episodes (could be architecture)?

Efficiency

- What are **useful types of episodic queries** across a variety of tasks? Better task/cue analysis -> better heuristics/approximations!

Discuss!

- Typical uses of epmem
 - Kinds of queries/domains
 - Engineering “hacks”
- Problems with current implementation
 - Speed
 - Limitations
- Research issues