PANEL: Ontology and Agent Memory

“ How can ontologies and structured knowledge become a practical foundation for AI agents that remember, reason, and act reliably? ”

Ontologies/ Structured Knowledge as Practical Foundation for AI Agents

Support non-expert user

- Automatic Reformulation of Input Prompts via
  - Machine Leaning solutions for assessing the prompt engineering technique to be used
  - Prompt Engineering Ontology (PEO https://github.com/rbarile17/peo)
  - Automatic reformulation of an Input Prompt in a new prompt using the predicted prompt engineering technique

Reliable Acts of Agents

- Providing Calibrated Answers via
  - Structured Contextual Knowledge (Graphs)
    - in case of a contradiction, a possible node mutation should be considered and a potential divergence recorded, enabling human audits
- Probabilistic Neural-symbolic learning methods
  - Avoiding agents overconfident in wrong answers and underconfident in correct ones

Ontologies/ Structured Knowledge as Practical Foundation for AI Agents

Increased Trustworthiness in AI agents

- Providing explanations
  - in agreement with (factual) evidence and a (rationale) reasoning process
  - handling “Why not?” questions
    - e.g. indicating what evidence would have needed to change for a different decision to occur
- Up to date knowledge
  - Relatively easy to update structured knowledge particularly in case of new info
  - No need to re-train agents (as for LLMs)