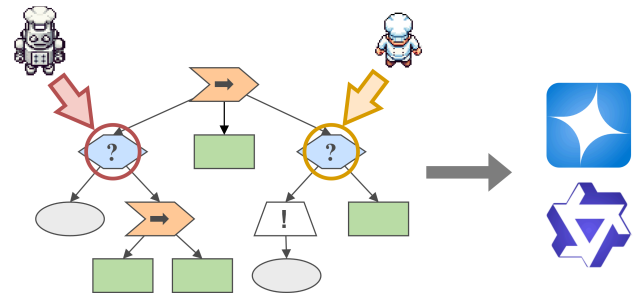




Task Knowledge for LLMs: Optimizing Behavior Tree Representations

Bachelor – A behavior tree (BT) is a compact and interpretable way to represent tasks and their structure. When a language model has to reason about those tasks, how the tree is written to it matters a lot. This thesis studies how to represent a BT to an LLM: which serialization to use (plain text, structured or abstracted summaries, key-value or pruned views), how much of the tree to include, and what makes the model's decisions more accurate, consistent, and faster. The goal is a compact, effective task-knowledge representation that a model can read and work with reliably.



Tasks

- Implement several BT-to-text representations (full, pruned, abstracted/summarized, key-value).
- Build an evaluation harness that measures LLM decision quality, consistency, and latency across representations.
- Identify the representation with the best trade-off of accuracy, brevity, and speed, and document the findings.

Your Profil

- Basic programming experience (Python) and familiarity with LLM prompting.
- Interest in knowledge representation and natural language processing.
- Curiosity about how models read and use structured data.

Interested?

If you are interested or have further questions, please send an email to fschroeder@techfak.uni-bielefeld.de.