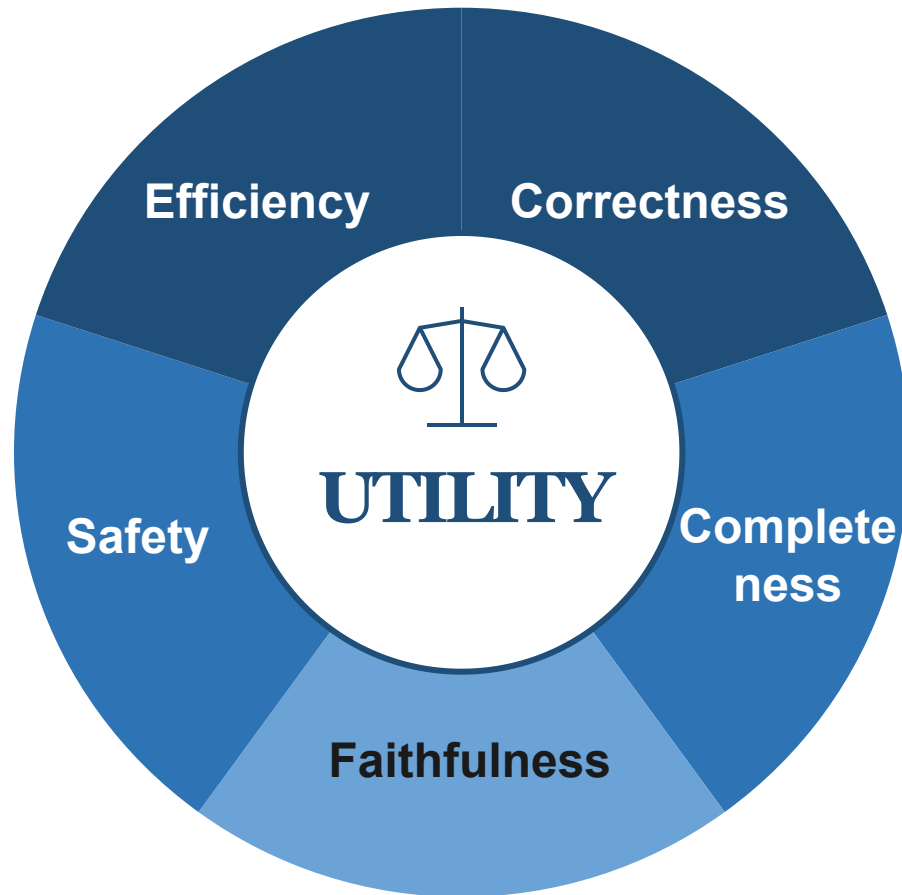




SECTION 5

Open Problems

Five open problems on the path to reliable utility-centric retrieval.



OPEN QUESTIONS

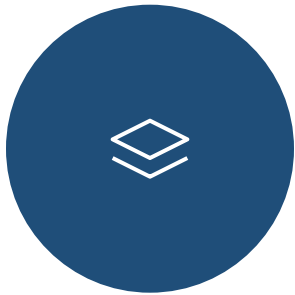
How do we define utility beyond factoid QA?

How do we compare utility across domains?

How do we represent negative utility?

How to combine correctness, completeness, faithfulness, safety, and efficiency?





A budgeted,
complementary,
attributable set of
evidence.

OPEN QUESTIONS

How to balance coverage and complementarity?

How to avoid redundancy and conflict?

How to evaluate marginal contribution?

How to assemble context under token budgets?

How to preserve provenance and attribution?

Context utility is a composition problem; combinatorial explosion



Scale labels, retrievers,
judges, and evaluation.

OPEN QUESTIONS

How to scale high-fidelity utility labels?

How to train corpus-scale retrievers?

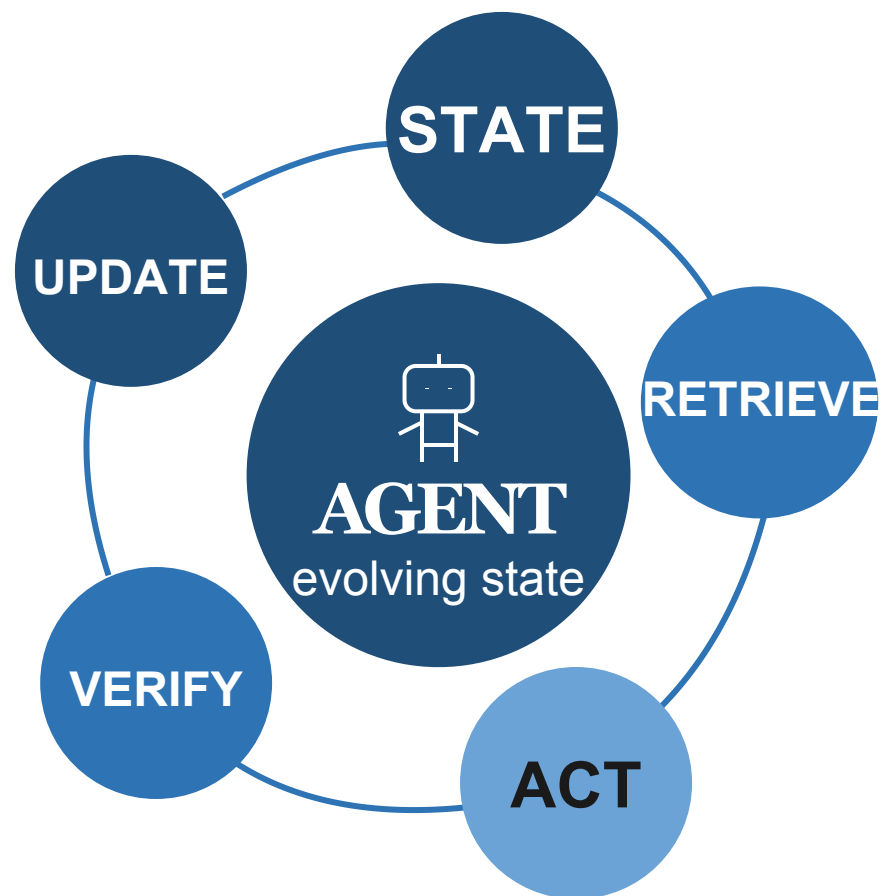
How reliable are LLM judges?

How to isolate retrieval from the generator?

How to evaluate open-ended & agentic tasks?

RESEARCH NEED

Scale labels — and isolate retrieval from generator ability.



A MAJOR FRONTIER

Search agents make retrieval dynamic again—and the retriever must catch up.

Next-step or final-answer utility?
Trajectories as click logs?
Reward assignment across long trajectories
Evidence verification

Tutorial Recap

180 min total

- 01 **Introduction & Foundations -Keping**
Why retrieval objectives must change for LLM consumers
- 02 **What Is LLM-Centric Utility? -Keping**
Task, model, context, and presentation dimensions
- 03 **Utility Modeling & Optimization –Hengran**
Signals, labels, trainable components, and evaluation
- 04 **Utility in Agentic RAG -Keping**
Utility in dynamic retrieval and agent loops
- 05 **Open Problems & Q&A -Keping**
Open problems and discussion

40 MIN

50 MIN

40 MIN

40 MIN

10 MIN



Tutorial website

SIGIR 2026 TUTORIAL · CONCLUSION

Thank You

Questions & Discussion

Beyond Relevance: Utility-Centric Retrieval in the LLM Era

Hengran Zhang · Minghao Tang · Keping Bi · Jiafeng Guo

Institute of Computing Technology, CAS · University of Chinese Academy of Sciences
<https://stay-hungry-time.github.io/utility-tutorial/>



Tutorial website