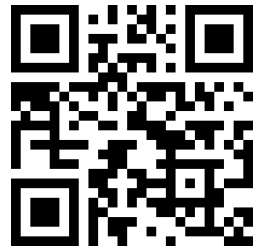


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Institut für Angewandte Informatik



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LLM Agents for Knowledge Graphs: Our Experience So Far

With funding from the:



Federal Ministry
of Research, Technology
and Space

FKZ: 13XP5230L

FKZ: 13N17700

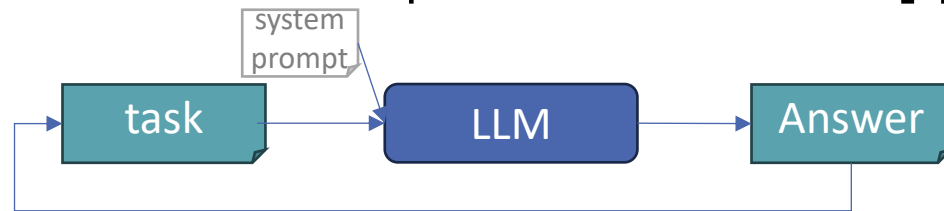
FKZ: 16DTM312D

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& ScaleTrust

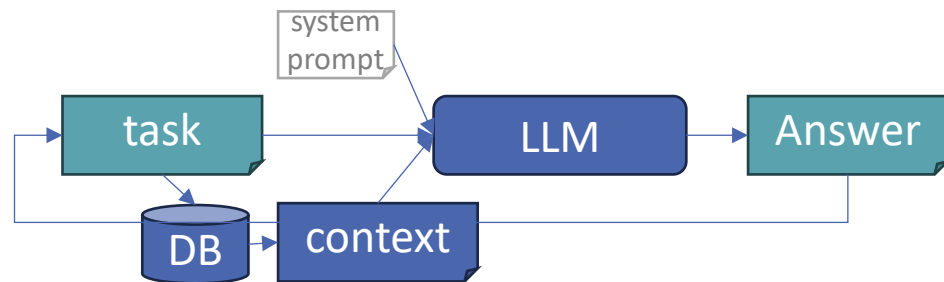
Lars-Peter Meyer & Felix Brei
InfAI e.V., ETi Competence Center

LLM Agents

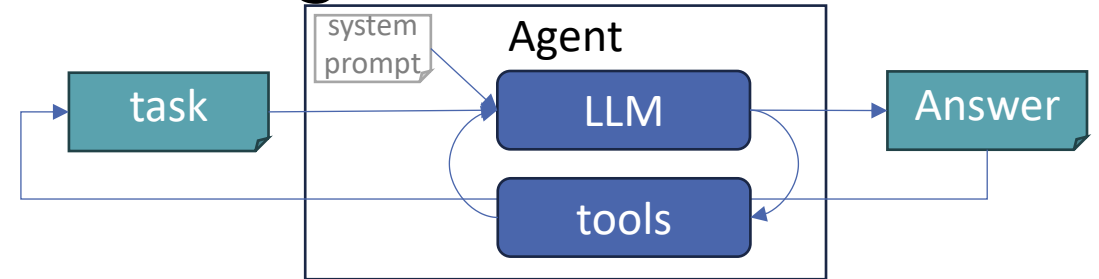
- LLM completion / chat [1]:



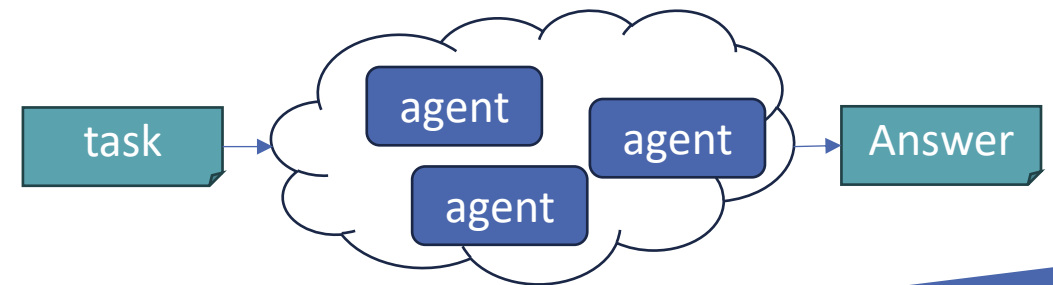
- RAG:



- LLM Agent:

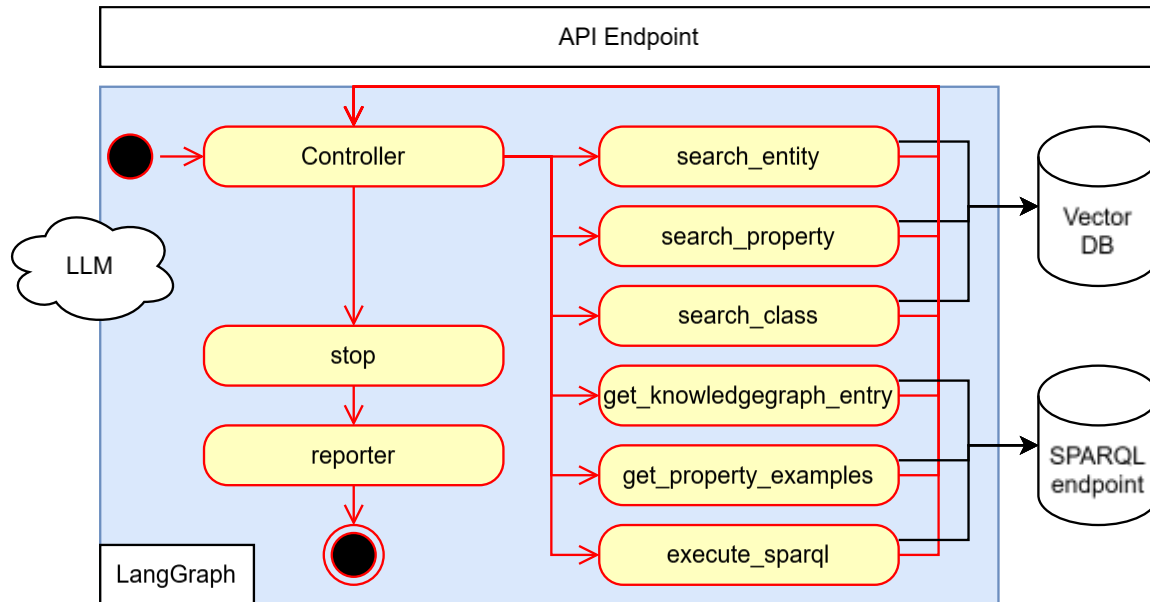


- Multi Agent Orchestration:



[1] Meyer et al 2025: "LLM-KG-Bench 3.0 ..."

Text2Sparql with ARUQULA



- Tool call support needed
- Cheaper models OK
- LLMs ignore rules
- Answers not always good
 - Checks needed
- Details are important

Text2Sparql Challenge 2025:

🥇 1st: DBPedia25

🥇 1st: CK25

Text2Sparql Challenge 2026:

🥈 2nd overall

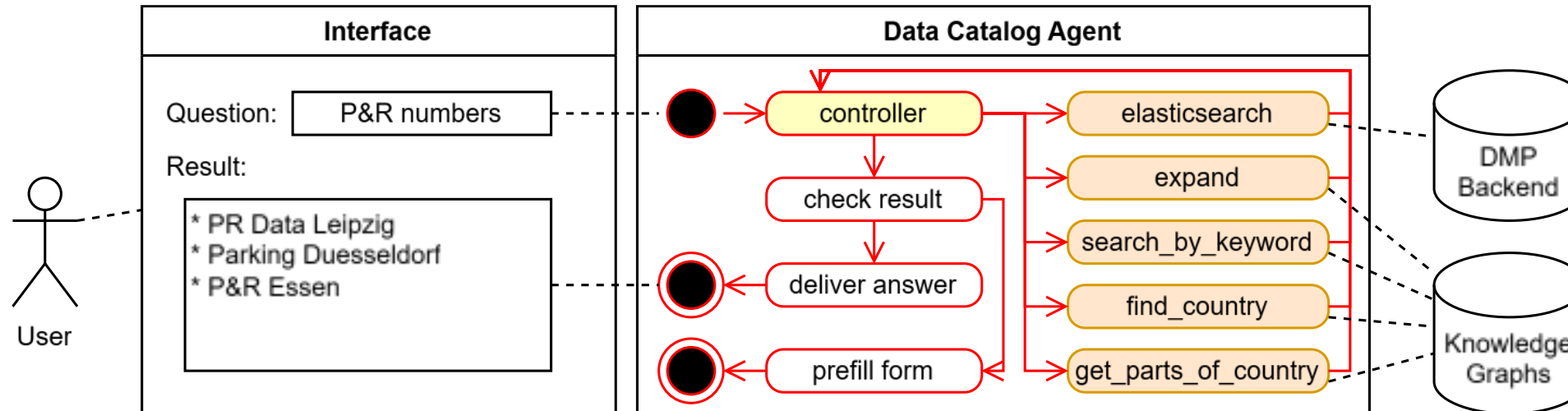


[2] <https://text2sparql.aksw.org/>

[3] Liu et al. 2024: "SPINACH: ..."

[4] Brei et al 2025: "ARUQULA ..."

Assista

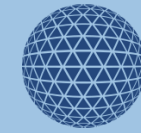


- problem selection
- structured output
- support with result checks

- Limit search result
- Context pruning



<https://dmp.advaneo.com/>



Assista Example

❖  Hello! I am Advanea, I can assist you with finding relevant datasets from our marketplace.
Please tell me what you are looking for.

I want to research public transportation in Norway

❖ Using  **elasticsearch** with parameter public transportation Norway.

❖ Using  **elasticsearch** with parameter public transportation Oslo.

❖ Using  **elasticsearch** with parameter public transportation Bergen.

❖ Using  **elasticsearch** with parameter public transportation Trondheim.

❖ Using  **elasticsearch** with parameter public transport Norway.

❖ Using  **elasticsearch** with parameter urban mobility Norway.

❖ I found the following datasets that could help you with your query

 **National dataset for public transport information in Norway** | [Link](#) 

 Entur was established in 2017 to gather information about public transport services all of Norway in order to promote collective travel more accessible.

erika.mustermann@musterfirma.ag

Data Requirements

Kind of Data

air quality data

Needed Parameters

concentrations of pollutants (e.g., PM2.5, PM10, NO2, O3), air quality index values, measurement locations

Specify the required data parameters separated by commas.

Frequency

hourly or daily

Time Interval

recent and historical data for at least the past five years

Access Type

via download as file, and if possible, via an API

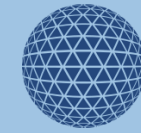
General Feedback / Notes (Optional)

I could not find any datasets about air quality or air pollution in Germany or its federal states.

 Submit

 Cancel

<https://dmp.advaneo.com/>



More...

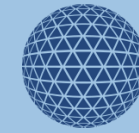
- Ontology term search
- Claude Code 4 Text2Sparql
 - Good but inefficient
- Agent worked around broken tools
- Agent take „shortcuts“

Who is the mayor of biggest city in saxony?

```
SELECT ?mayor {  
  dbr:Leipzig dbp:mayor ?mayor .  
}
```

```
SELECT ?c {  
  BIND (dbr:Burkhard_Jung AS ?c)  
}
```

Summary



Agents Summary:

- improve results & help with KGs
- Details are important
- Agents are slow
- Results need checks

Contributors to agents shown:

- Claus Stadler
- Daniel Gerber
- Felix Brei
- Gordian Dziwis
- Johannes Frey
- Kirill Bulert
- Kurt Junghanns
- Lars-Peter Meyer
- Lorenz Bühmann

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