Searching Linked Data Graphs with GraphScope

Linked Open Data in Agriculture
MACS-G20 Workshop in Berlin, Sept 2017

Dr. Daniel Herzig-Sommer
dh@metaphacts.com
https://metaphacts.com
COMPANY FACTS

• Founded in Q4 2014
• Headquartered in Walldorf, Germany
• Acquired SearchHaus GmbH in 2017
• Currently ~10 people
• Platform for knowledge graphs and knowledge graph applications
What are Knowledge Graphs?

- **Semantic descriptions** of entities and their relationships

- Uses a knowledge representation formalism (RDF, RDF-Schema, OWL)

- **Entities**: real world objects (places, people, ...) and abstract concepts (religions, professions, ...)

- **Relationships**: graph-based data model where relationships are first-class

- **Semantic descriptions**: types and properties with a well-defined meaning

- Possibly axiomatic knowledge (e.g. rules) to support automated reasoning
Knowledge Graphs Enable Intelligent Applications

Applications
- Semantic Search
- Question Answering
- Analytics
- Dashboards
- Knowledge Sharing
- Knowledge Management

Services
- Authoring
- Publishing
- Data Access
- Publishing
- Security
- User Management

Knowledge Graph
- Entities
- Relationships
- Semantic Descriptions

Data Sources
Data Integration, Data Transformation, Virtualization, Federation
metaphactory

End-to-end platform to create and utilize enterprise knowledge graphs
metaphactory supports the lifecycle

- Authoring
- Visualization
- Search
- Querying & Inferencing
- Storage & Repositories
- Data Linking & Enrichment
- Data Extraction & Integration

metaphacts
end-to-end
platform
the graphsearch engine for Linked Data

GraphScope
smart data search
GraphScope helps you to find related objects in your data
Scenario: *Danish Agricultural Government Data*

**Agricultural data**
- Fields
- Crops

**Business data**
- Fieldownership
- Companies with address, activities

Alex B. Andersen, Nurefsan Gür, Katja Hose, Kim A. Jakobsen, and Torben Bach Pedersen

*Publishing Danish Agricultural Government Data as Semantic Web Data*

2015, Springer International Publishing, 978-3-319-15615-6

[https://link.springer.com/chapter/10.1007%2F978-3-319-15615-6_13](https://link.springer.com/chapter/10.1007%2F978-3-319-15615-6_13)
“Who grows spinach?” (danish spinat)
Keyword query is internally translated into SPARQL by GraphScope
What crops are companies producing, which are registered with activity dairy cattle.
• **Just keywords, no more SPARQL**
  - Users don’t need to be SPARQL experts to leverage the power of graph data. Just searching by keywords is enough to take advantage of the relationships in their data and find relevant data.

• **Simple interface**
  - A search box, known to every user, is the interface to start a search. GrapeScope understands users’ requests and provides feedback on how their search was interpreted. Users can alter their request easily.

• **Engages everybody**
  - GraphScope enables everybody to search the data graph, not just IT-experts. More insights to the knowledge captured by your data will be gained.

• **Exploration**
  - GraphScope allows you to discover data related to your search result and explore relevant data.
GraphScope Technology

Keyword Query

NLP processing
- Stemming
- Synonyms
- Entity recognition

Your Knowledge Graph

Graph algorithms
- Top-k processing
- Compute relevant paths
- Discover relationships
- Graph analytics

In-memory datasynthesis
- Built from customers' data
- Abstracts schema and content

Statistical analysis
- Scoring
- Relevance ranking
- Priority scheduling

Interpretations process
- Cognitive processes
- Query and data understanding

GraphScope Computation

Result presentation
- Precise facts
- Options to enhance results
- Suggestions for further interpretations
GraphScope generates SPARQL queries from keywords in subseconds for a given RDF graph.

Graphical user interface for result modifications and further interactions.

GraphScope combines the simplicity of keyword search with the precision of database queries.

GraphScope is part of the metaphactory platform.
metaphacts GmbH
Daimlerstraße 36
69190 Walldorf
Germany
p +49 6227 6989965
m +49 157 50152441
e info@metaphacts.com
@metaphacts