Reference:	Knowledge Engineering – SES (QSE: SES)
Topics:	Semantic (Exploratory) Search
LVA-Type:	Praktikum, Bakk, Dipl
Start:	Ab sofort
End:	Nach Vereinbarung
Contact:	Marta Sabou (Marta.Sabou@tuwien.ac.at)
	Fajar J. Ekaputra (Fajar.Ekaputra@tuwien.ac.at)
	Stefan Biffl (Stefan.Biffl@tuwien.ac.at)

Background

Semantic search systems are a novel type of search systems which rely on semantic elements (e.g., ontologies, knowledge graphs), to improve on standard keyword-based search, for example, by providing a more structured representation of search results. Often, the semantic structures that underlie these systems can be used to derive additional, new information which can further improve search – in particular, related and novel information is derived to complement the search results thus supporting the user *exploration* of the search space. Our group has investigated semantic exploratory search systems, in particular within the STAR project which extends traditional keyword-search systems with semantic and exploratory aspects (see Figure 1).
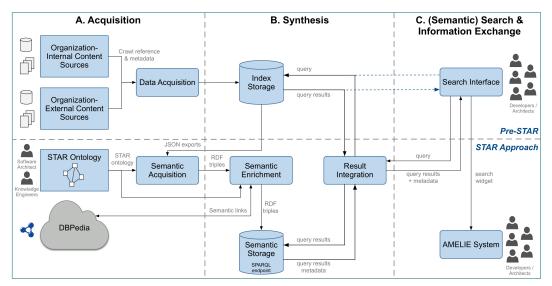

Figure 1 Extension of a keyword-search system into a semantic exploratory system with the STAR approach.

Currently, previous research has investigated various front-end (user interface) and back-end (algorithms for deriving new knowledge, various semantic storage systems) options which are now ready to be incorporated into an overall, generic system architecture. We offer several thesis opportunities in this research area around the task of combining the current elements into an overall infrastructure and a concrete prototype.

Ideas and implementation of additional modules, such as (semi-)automatic data acquisition from documents (and web), managing the change of domain knowledge, and personalization of exploratory search interface based on user profiles, are welcome.

Task

Depending on the type of the thesis, the students will perform tasks of varying complexity:

For a Bakk Thesis, the student will combine various components into a prototype for a given domain, e.g., music.

For a master Thesis, the student is expected to create a modular, overall software architecture from which new prototype systems can be easily derived.

Experience and skills needed

- Good communication skills in English (Oral & Written).
- Good programming skills (e.g., OOP, Java, database)
- Basic understanding and interest in Semantic Web.
- Prior knowledge of the following technologies would be helpful:
  - Semantic Web Technology stack (e.g., RDF/S, OWL, Jena, RDF4J, Protégé)
  - NoSQL technologies (e.g., MongoDB)
  - REST API / Framework (e.g., SparkJAVA)
  - Web server (e.g., Apache, Nginx)