Preface for the Fourth International Workshop on LLM-integrated Knowledge Graph Generation from Text

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TEXT2KG is the fourth Workshop on Knowledge Graph Generation From Text co-located with ESWC-2025. The primary aim of this workshop is to bring together researchers from multiple focus areas such as Natural Language Processing (NLP), Entity Linking (EL), Relation Extraction (RE), Knowledge Representation and Reasoning (KRR), Deep Learning (DL), Knowledge Base Construction (KBC), Semantic Web, Linked Data, and other related fields to foster a discussion and enhance the state-of-the-art in knowledge graph generation from the text. The workshop had an exciting invited keynote, Anna Fensel, Professor, University of Amsterdam, Netherland and an interesting Panel Session with Anna Fensel, Axel Polleres, Paul Groth, Andreas Both on "From Symbols to Semantics: The Convergence of Symbolic AI, LLMs and Foundation Models by Knowledge Graphs?". The organizing team is thankful to everyone involved in making the TEXT2KG workshop 2025 a success. First, our thanks go to all the organizers of the main events and Program Committee members for ensuring a rigorous review process that led to an excellent scientific program and an average of three reviews per article. TEXT2KG team is also thankful to keynote speaker (Anna Fensel), Panel Speakers and all steering committee (Amit Sheth, Sören Auer, Alfio Gliozzo, Enrico Motta, Anna Fensel, Maria Esther Vidal, Edlira Vakaj, Fernando Ortiz-Rodriguez, Sven Groppe), and Publicity Chair (Joey Yip and Ronak Panchal) for their valuable contributions.

TEXT2KG 2025 workshop has received 17 papers and accepted 13 papers after a rigorous reviewing process. All accepted papers were long papers. Each paper was reviewed by three reviewers with different backgrounds. The following papers were accepted for publication and presented at the workshop:

- SAMM Copilot: Bootstrapping Semantic Models with the Eclipse Semantic Modeling Framework from Domain Data in JSON Using Large Language Models
- PrO-KGC: Prompt Optimization for LLM-Based Knowledge Graph Completion

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- A Grounded Memory System For Smart Personal Assistants
- Semantic Enrichment of the Quantum Cascade Laser Properties in Text- A Knowledge Graph Generation Approach
- Enhancing Text2Cypher with Schema Filtering
- Wikidata Hierarchy for Named Entity Type Discovery in the Climate Change Domain
- FrOG: Framework of Open GraphRAG
- Ontology Engineering with Large Language Models: Unveiling the potential of human-LLM collaboration in the ontology extension process
- LLM-Powered Knowledge Graph of Causal Relations in Drug Reviews
- Enhancing Public Contract Code analysis with Graph Retrieval-Augmented Generation
- Extraction of Patient Subtypes using LLM Generated Knowledge Graphs Integrated With a Transformer Architecture
- Instruction-Tuned Language Models as Judges for SPARQL Query Correctness in Knowledge Graph Question Answering
- Ontology Evolution in Invasion Biology Using Large Language Models: A Hybrid Approach

Keynote Anna Fensel

Talk Title "Powering Generative AI with FAIR Data and Knowledge Graphs: From Data Integration to Scientific Automation"

Abstract

The convergence of knowledge graphs (KGs), semantic web technologies, and large language models (LLMs) is transforming how we approach complex, data-intensive challenges across research and industry. This integration creates powerful opportunities for scientific discovery and innovation, particularly when aligned with FAIR principles (Findable, Accessible, Interoperable, Reusable) and responsible AI practices. While symbolic AI and semantic technologies provide robust frameworks for data modeling and interoperability, persistent issues such as low data quality and insufficient semantic richness continue to limit the utility of FAIR data in AI-driven analyses, including those powered by LLMs. LLMs offer new capabilities in knowledge extraction, summarization, and reasoning, yet their effectiveness depends heavily on access to high-quality, well-structured, and domain-specific knowledge sources. KGs can serve as critical infrastructure to ground LLMs, reduce hallucinations, and improve explainability and trust in generative outputs. However, real-world implementation of these hybrid systems faces additional challenges, including data heterogeneity, legal compliance (e.g., GDPR, AI Act), fragmented governance, and concerns over data ownership. In this talk, I present approaches for FAIRifying data using KGs, illustrated with examples such as from the Horizon Europe SoilWise project, and explore how such enriched ecosystems can power LLM-based applications and advance toward agentic AI and the automation of scientific work, particularly in the life sciences.

Panel Session

Anna Fensel, Axel Polleres, Paul Groth, Andreas Both: **From Symbols to Semantics: The Convergence of Symbolic AI, LLMs and Foundation Models by Knowledge Graphs?**

Best Paper Award

- We have taken the opinion of all organizers and steering and advisory committee to decide the best paper award and it was finally awarded to:
  - **Ontology Engineering with Large Language Models: Unveiling the Potential of Human-LLM Collaboration in the Ontology Extension Process**. *Julia García Fernández, Jack Verhoosel Jolien Ubacht, and Roos Bakker*

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