

Editorial: Special issue on Interactive Semantic Web

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This special issue on the Interactive Semantic Web presents selected papers that contribute to the design, development, and refinement of all aspects of human interaction with the Semantic Web. The scope of this special issue is twofold: i) interactive techniques and visualizations that assist the human in tasks (e.g., browsing, inspecting, inferring) involving semantic data such as ontologies, linked data, knowledge graphs etc.; and ii) intelligent interfaces such as those that are driven by semantic technologies and other forms of machine intelligence, as well as those that empower users with personalizable and adaptive features.

Given recent advances in Semantic Web interfaces and various interactive support for the human users working with semantic data and knowledge-enabled systems, this special issue places emphasis on the growing area of Interactive Semantic Web, whereby technologies are developed with a human-centered approach that aims to enhance human interaction with semantic data beyond improving the efficiencies and accuracies of automated algorithms and techniques, but also accounting for human factors and user perspectives, as well as leveraging semantic technologies and computational intelligence in problem-solving. The papers included in this special issue contribute to the design and development of a new generation of human-centered interfaces for the Semantic Web, as well as semantically empowered interfaces and visualizations, whereby appropriate integrations of interaction techniques and visual analytics lie at the center of the next generation semantic systems. Within this context, interactive data representation, explainable models, and analytical techniques may provide the necessary meaningful platform for users to better understand, explore, correct, and modify intelligent semantic systems. As such, this special issue aims to highlight the breadth of research within the scope of Interactive Semantic Web, such as interaction design and integration, visualization algorithms and techniques, and empirical studies that collectively advance and accelerate research in all aspects of human interaction with semantic data. The main topics emphasized in this special issue include:

- Interface artifacts that contribute to the development and refinement of novel and existing interactive techniques and interaction methods;
- Visualization systems and visual analytics that support different groups of users (with diverse levels of visualization literacy and skills) in various types of tasks (e.g., information seeking, observation, dissemination, and collaboration) and domains (e.g., scientific, social, industrial) within the Semantic Web;
- Intelligent interfaces and visualizations empowered by semantic technologies and other forms of machine intelligence that enable various degrees of automated capabilities in the rendering of interfaces and visual representations that enable human users to better understand, engage with, and influence the underlying algorithms, models, and interfaces such as adapting to a specific user, task, or domain;
- Explainable interfaces for knowledge-based systems that provide justification or intervention mechanisms for the human user to improve system effectiveness and reliability;

- Algorithms and techniques that transform data, render visualization, and traverse beyond multiple interaction modalities in application-specific or general-purpose plug-ins, apps, or platforms;
- Theoretical and empirical user studies and experiments that contribute to better understanding of users, such as user preferences, actions and behaviors, goals and context, cognitive and perceptual capabilities during interaction with semantic data; and
- Software, tools, and systems that facilitate the development of interfaces or visual representations for semantic data and semantically enabled applications.

Among 14 submissions, a total of 5 manuscripts have been selected to be included in this special issue, including 4 full research papers and 1 application report as follows.

- *Understanding the Structure of Knowledge Graphs with ABSTAT Profiles* presents a framework designed to provide concise pattern-based profiles and faceted interfaces for users to comprehend knowledge graphs, with user studies indicating better formulated queries and faster browsing when completing SPARQL queries against Web Protégé as the baseline system.
- *MuHeQA: Zero-shot Question Answering over Multiple and Heterogeneous Knowledge Bases* proposes a knowledge graph question answering system designed to overcome limitations of existing approaches that are structure dependent or require domain specific training data, by retrieving answers from textual content in knowledge graphs instead of querying over them, with evaluation results indicating comparable performances to other approaches in single-fact questions when experimented with Wikidata and DBpedia.
- *What is in Your Cookie Box? Explaining Ingredients of Web Cookies with Knowledge Graphs* presents a timely study on privacy and informed consent utilizing a knowledge graph enabled tool to personalize and visualize cookie consent, with the overall goal of increasing user awareness and caution when giving consent.
- *CEO: Counterfactual Explanations for Ontologies* proposes a novel method to explain inconsistencies in ontologies using counterfactual explanations by leveraging eXplainable AI in the knowledge representation and reasoning domain.
- *LOD4Culture: Easy Exploration of Cultural Heritage Linked Open Data* presents an application report of a web application designed for non-Semantic Web experts to explore world-wide Cultural Heritage sites for the purpose of tourism and education and highlights the benefits of employing Semantic Web technologies in real-world use cases.

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