Preface

Semantic web is 20 years old and has gained much attention in recent years. There have been many exciting developments on the concept, requirement and standard of late in the semantic web and technology space in academia and industries. The era of big data leads to consideration of the adoption of artificial intelligence and internet of things techniques to facilitate today's semantic web science applications. Thus, the semantic web thus becomes younger as a new research area in artificial intelligence and internet of things are based on the semantic web.

We are happy delivering this volume with the support from international experts and editors. This book is a manifestation of some of the most interesting aspects of theoretical and applied research covering complementary facets of the semantic web science and real-world applications, for instance:

- Extracting the company acquisition relations in webpage
- Linked data-based recommendation system
- OSGi semantic information broker implementation for Internet of Things
- Semantic sensor web architecture for Internet of Things
- Semantically-enhanced annotation and reasoning for linked data extension
- Data replication impact on distributed database
- Context-awareness of duty-cycled broadcast wireless sensor networks
- Recursive localization for high density wireless sensor networks
- Musical entities reconciliation architecture for recording linkage in music related database
- Sarcasm detection in twitter data
- Multi-version ontology-based personalization of clinical guidelines for patient centric healthcare
- Leveraging semantic features for time-sensitive hashtag recommendation on twitter network
- Advanced evaluation on ontology quality

This book covers the discussion on the semantic web science and real-world applications via 13 chapters. The summary of each chapter is given as follows.

The first chapter focuses on the algorithm for company acquisition relations extraction from webpage. The key steps of the algorithm are (i) The tense of every sentence is scanned in a webpage using conditional random fields; (ii) The tense is acted as input for sentence classification in order to evaluate the semantic strength of the candidate sentences in describing company acquisition relation; and (iii) The candidate acquisition relations are ranked and only the top-k are shown. This effectiveness of the proposed algorithm is evaluated using 6000 webpages.

It can be seen that data is published on the web freely and thus joining dataset of different domains is challenged by heterogeneity of linked data. Chapter 2 proposes a framework named AlLied for executing and deploying existing algorithms for recommendation of related linked data. Authors also investigate the approach to select the best algorithm in special application and whether there is a unique algorithm that is able to perform well in ubiquitous applications.

In Chapter 3, semantic information broker based IoT system is proposed. It is interoperable, portable and extendable solution which supports semantics, publish expressive primitives and subscribe paradigm for modelling the knowledge. Authors suggest an essential future work that security should be addressed to provide availability, integrity and confidentiality of data.

Attention is also drawn to IoT system in Chapter 4 that an architecture is proposed for linked data following the linked data standard or semantic web enablement standard. Performance evaluation is made on three scenarios (i) linked wireless sensor network data; (ii) semantic wireless sensor network web enablement; and (iii) contextual data mining over wireless sensor network. Future work could be supplementing each sensor in order to reflect the peculiarities of the certain domain and devices at the input, as well as services acquired at the output in the context of IoT.

Chapter 5 defines a new semantic reasoning and annotating approach for extension of implicit semantics into SPARQL pattern which is targeted for linked data sources. In the future, machine learning is believed to play an important role in semantic mapping, relatedness assessment between entities in linked data, RDF documents retrieval, clustering and classification.

Response time and communication cost are important criteria in evaluating the successfulness of distributed database system. Chapter 6 modifies the heuristic clustering-based method to fragment data. Key replicated based data allocation scenarios are considered named non-replicated based data allocation scenario, full replicated based data allocation scenario and mixed replicated based data allocation scenario. It is worth noting that the data replication will lead to poor performance in distributed database system when it comes to heavily query of update activities.

Authors in Chapter 7 propose an enhanced-efficient (end-to-end delay and throughput) context-aware multi-hop broadcast protocol which relies on multi contextual information to optimize resources usage and satisfy the application requirements in a duty-cycled environment. It has been demonstrated that one transmission is sufficient to maintain normal broadcast operation in general applications

Chapter 8 shares an idea of efficient recursive localization that develops a new reliable reference selection strategy to ensure a better distribution of the reference nodes in the network. In other words, nodes having better (lower) residual errors choose smaller periods. The algorithm improves localization accuracy without scarifying additional cost. In addition, it allows conserving the energy and consequently prolonging the WSN life time.

Data heterogeneity hinders the development on the detection of duplicated entries. Authors in Chapter 9 propose a semantically based musical entities reconciliation architecture that matches entries of two sources so that more support sources can be utilized to enhance the performance of entries detection. Further investigation is recommended to see if the proposed architecture can be applied in big data environments.

In Chapter 10, an automated system for sarcasm detection in social media text using six supervised algorithms is proposed. It is capable to analyze the various types of sarcasm occurs in Twitter data based on contextual, hyperbolic, pragmatic and lexical features. Nevertheless, authors have pointed out that semi-supervised and unsupervised classification algorithms are more useful in certain application like text regional languages.

Chapter 11 continues the research on ontology-based personalized access to very large collections of multi-version documents by addressing a novel challenge: dealing with multi-version clinical guidelines but also with a multi-version ontology used to support personalized access to them. It proposes an exhaustive analysis of the state of the art in this field.

Then, Chapter 12 deals with a hashtag recommendation system on microblogging platforms by leveraging semantic features. Then, authors conduct a detailed study on how the semantic-based model influences the final recommended hashtags using different ranking strategies. At last but not least, a linear and machine learning based combination of these ranking strategies are proposed.

In the last chapter, authors comprehensively present the various facets of ontology evaluation. It is the process of determining the quality of the ontology on the basis of some pre-defined criteria. It is often done to determine which out of all the ontologies developed for the particular domain better conceptualizes the knowledge of the domain.

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