Journal of Universal Computer Science, vol. 17, no. 7 (2011), 981-982
submitted: 15/3/11, accepted: 24/3/11, appeared: 1/4/11 © J.UCS

Semantic Web: Theory and Applications
J.UCS Special Issue

Michael Granitzer
(Know-Center Graz and Graz University of Technology, Graz, Austria
mgrani@know-center.at)

Stefanie Lindstaedt
(Know-Center Graz and Graz University of Technology, Graz, Austria
slind@know-center.at)

This special issue features extended papers from the International Conference on Knowledge Management and Knowledge Technologies 2010 (I-KNOW 2010) held in Graz, Austria, September, 1-3, 2010. It comprises eight articles addressing theoretical as well as application oriented aspects of the Semantic Web.

The first three papers pick up theoretical aspects of Semantic Web, namely RDF, ontology evaluation and ontology development. The first article picks up the problem of query languages for RDF which however do not support fuzzy queries. The authors introduce a new method that transforms subject-relation-object into activation patterns. This represents a common model as basis for sophisticated analysis methods such as semantic relation analysis or anomaly detection. The Activation Patterns concept is introduced and applied to an RDF representation of the well-known CIA World Factbook. The second paper is concerned with ontology evaluation and the problem that currently there are no algorithms that detect most of the errors. As a consequence the authors designed and implemented space and time optimised algorithms for detecting, among others, circulatory errors, redundancy of sub class and sub property or redundancy of disjoint relation. The algorithms were successfully evaluated on the Gene Ontology (GO), the WordNet Ontology and the OntoSem Ontology. The third paper is concerned with ontology classification and the problem of lacking accuracy when treating ontologies as plain texts in classification problems. In order to meet these problems the authors suggest a new ontological methodology for the classification of web ontologies. They propose the framework OntClassifire whose usefulness has been verified by testing it on 34 ontologies.

The next five papers discuss practical applications of the Semantic Web in various settings. The first paper highlights the importance of processing knowledge contained in wikis by machines. It shows how a Spatial Hypertext Wiki - i.e. a wiki that represents knowledge by spatially distributed notes and visual characteristics - becomes a semantic wiki by making use of hypertext, and how semantic web features of ShyWiki improve navigation and publish the wiki knowledge as RDF resources. The second paper discusses how semantic technologies could be exploited for comparing qualifications in the field of human resources acquisition. The EQF specifications are taken into account and they are applied in a practical scenario to develop a ranking algorithm for the comparison of qualifications expressed in terms

of knowledge, skill and competence concepts, potentially aimed at supporting European employers during the recruiting phase. The third paper discusses strategies of introducing ontologies at different user interface layers adapted from user experience elements. The proposed ontological framework enables device independent, semi-automated GUI construction which is demonstrated at a personal information management example. The fourth article discusses the process of the design and implementation of a competency management system in the information and communication technologies domain utilizing the latest Semantic Web tools and technologies. In particular, the paper discusses the process of building individual and enterprise competence models in a form of ontology database, as well as different ways of meaningful search and retrieval of expertise data on the Semantic Web. The last paper is concerned with the problem of retrieval in health care systems that mostly consist of textual data and free text in particular. Different types of information retrieval strategies are evaluated and compared with respect to its appliance in medical health care systems.

Finally, before you immerse yourself into this interesting readings, let us thank the authors for their excellent contributions and also thank the PC members of I-KNOW 2010 as well as external reviewers who contributed with their reviewing efforts to this high quality special issue.

Michael Granitzer and Stefanie Lindstaedt

Graz, March 2011