Preface

This special issue of the Journal of Web Semantics contains revised and extended versions of some of the best papers presented in the Research Track of the Third International Conference on the Semantic Web (ISWC 2004), which took place in Hiroshima, Japan November 7–11, 2004. The conference was the most successful of the ISWC conferences to date, attracting more than 400 attendees from all over the world. This is a good indication that the Semantic Web has been firmly established on the research agenda. The research track received 205 submissions of which 48 were accepted for publication. The conference sessions were well attended and both the invited talks and the paper presentations stirred stimulating discussions. Overall, the conference and its related events reflected the broad interest in the Semantic Web, and how active the field is.

The papers collected in this special issue reflect the diversity of Semantic Web research, with topics including complexity and decidability issues for RDFS and OWL, ontology authoring tools, semantic annotation, blogging on the Semantic Web, benchmarking OWL knowledge bases and planning for web service composition. One of the papers in this special issue, “LUBM: a benchmark for OWL knowledge base systems” by Guo, Pan and Heflin was the winner of the conference research track best paper award.

In “Completeness, decidability and complexity of entailment for RDF schema and an intentional variant of OWL”, Herman ter Horst provides completeness, decidability and complexity results for entailment in RDF schema using partial closure graphs. These graphs – finite for finite RDFS graphs – are computable in polynomial time and are proven to be sufficient for the decidability of entailment. The results are extended to RDFS enriched with datatypes and a subset of OWL. Entailment is shown to be NP-complete with its complexity reducing to being in P in the case of graphs with no blank nodes.

In “OntoTrack: a semantic approach for ontology authoring and explaining”, Thorsten Liebig and Olaf Noppens elaborate on the features and implementation of OntoTrack, an ontology authoring tool combining a graph-based hierarchical layout with instant feedback produced by reasoning on the consequences of the modeled ontology. Features such as zooming on the subsumption graph, context sensitivity, synchronization with an external reasoner and on-demand textual explanation provide substantial support to ontology designers in understanding the logical meaning and consequences of their design decisions.

In “From tables to frames”, Aleksander Pivk, Philipp Cimiano and York Sure address the automation of the data annotation process by discussing a methodology for generating F-logic frames from tables. They claim that this scalable approach permits the population of ontologies with data stored in heterogeneous table structures that would not otherwise be made available by search or query engines. The methodology is based on a cognitive table model that is generic enough to capture table-like structures of different types. HTML tables are used to demonstrate the applicability of this methodology and its evaluation.

In “What would it mean to blog on the Semantic Web?”, Dennis Quan and David Karger investigate the potential of capturing and exploiting the inherent semantic structure of web logs (blogs) and introduce semantic blogging as a paradigm for metadata generation and publication on the Semantic Web. Ontologies extending the RSS specifications are proposed along...
with an environment for semantic blogging based on the Haystack Semantic Web browser. The authors claim that their approach enables the integration of information from multiple blogs and the Semantic Web without the restrictions of single-blog viewing and without the need for a central authority.

In “LUBM: a benchmark for OWL knowledge base systems”, Yuanbo Guo, Zhengxiang Pan and Jeff Heflin present LUBM, the Lehigh University Benchmark featuring an ontology for the university domain and a method for synthetic OWL data generation. The paper addresses the need for establishing benchmarks for testing the scalability of repositories of knowledge expressed in OWL. The benchmark comprises fourteen extensional queries representing a variety of properties and it has been applied for comparing the performance of two memory-based systems and two systems with persistent storage varying in their storage models and their query evaluation techniques. Experimental results and conclusions drawn from the experiments using the proposed benchmark are reported.

Finally, in “Information gathering during planning for web service composition”, Ugur Kuter, Evren Sirin, Dana Nau, Bijan Parsia and James Hendler present a hierarchical task-network planning algorithm intended to support the composition of services described using OWL-S ontologies. The proposed algorithm (ENQUIRER) employs information-gathering queries issued at plan time, for providing information necessary for the planning process. The authors demonstrate the soundness and completeness of the algorithm and precisely characterize the likelihood of success in finding a plan with the amount of available information and the quality of the derived plan. Results of experiments with ENQUIRER that validate the theoretical results are reported.

After extensions and revisions the papers invited to this special issue underwent a thorough review process under a very tight schedule. We thank the authors of these papers for the submission of high-quality work and the reviewers for the tremendous effort they put into the task of evaluating these submissions. As with ISWC 2004, online reviewing for this special issue was supported by the Confious Conference Management System (http://www.confious.com) developed at FORTH-ICS by Manos Papaggelis. We thank Manos for his around-the-clock support of the review process. Last, but certainly not least, we thank Frank van Harmelen, the General Chair of ISWC 2004, without whose efforts and guidance the conference would not have been such a success.

We hope you have found this special issue of the Journal of Web Semantics both stimulating and enjoyable.

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