Semantic Enrichment in OWL Knowledge Bases

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ABSTRACT

The Semantic Web is still growing and the availability of large knowledge graphs increased over the past years. In spite of the growing number of knowlege bases there exist very few with a sophisticated schema. Often they only consist of a collection of facts with no consistant structure. Other knowlege bases contain only schema information without instances of the defined schemata.

But only the combination of both of these extremes, sophisticated schema and available instance data can enable powerful reasoning, easier checking for consistency and improved queryability.

This article show two methods for the semantic enrichment of large OWL knowlege bases. The first method focuses at finding and creating class expressions in an automatic or semiautomatic approach based on given knowlege in the graph. Whereas the second method enrichs knowlege bases with different types of OWL2 axioms.

General Terms

Theory

Keywords

Ontology engineering, Supervised machine learning, Knowledge Base Enrichment, OWL, Heuristics

1. INTRODUCTION

- semantic web: growing, bigger knowledge graphs

- Open data Initiative, Protoge ontologie etc -> hard to maintain, debug / find error inconsitencies

- lack sophisticated schema (only schema no instances, only facts)

- combination good schema + instance data –> powerful reasoning, consistency, improved query

- Example: Person birthplace + Benefits + missing info + semi-automated

2. ENRICHMENT OVERVIEW

- more

- more

- more

3. CLASS LEARNING

- more

- more

- more

4. ENRICHMENT WITH OWL AXIOMS

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- more

- more

5. HEURISTICS

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- more

6. HEURISTICS

6.1 Finding the right Heuristic

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- more

- more

6.2 Efficient heuristic computation

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- more

- more

7. EVALUATION HEURISTICS

- more

- more

- more

8. EVALUATION ON ONTOLOGY ENRICH-MENT

- more

- more

- more

9. RELATED WORK

- more [2]

- more [1]

- more [3, 4, 5]

- more [6]

10. CONCLUSIONS

- more

- more

- more

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