Knowledge Graph Embedding With Attentional Triple Context

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Abstract

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In this paper, we proposed a novel approach to learning disjointness and subclass axioms from incomplete semantic data under OWA. We first applied the type inference algorithm to generate new probabilistic type assertions. We then introduced novel definitions of support and confidence using negative examples as constraints. The experimental results were provided to compare our system with existing one and showed that SIFS-P performs better with respect to precision and recall in most cases.

In the future, we plan to extend the SIFS-P to learn more kinds of axioms such as the axioms with existential restriction, universal restriction and the limited extensional quantification.

References

- Lorenz Bühmann and Jens Lehmann. Universal OWL axiom enrichment for large knowledge bases. In *Proceedings of EKAW 2012*, pages 57–71, 2012.
- Lorenz Bühmann, Jens Lehmann, and Patrick Westphal. Dllearner - A framework for inductive learning on the semantic web. *J. Web Sem.*, 39:15–24, 2016.
- Daniel Fleischhacker and Johanna Völker. Inductive learning of disjointness axioms. In *Proceedings of OTM 2011*, pages 680–697, 2011.

- Luis Antonio Galárraga, Christina Teflioudi, Katja Hose, and Fabian Suchanek. AMIE: Association rule mining under incomplete evidence in ontological knowledge bases. In *Proceedings of WWW 2013*, pages 413–422, 2013.
- Jens Lehmann and Pascal Hitzler. Concept learning in description logics using refinement operators. *Machine Learning*, 1-2(78):203–250, 2010.
- Christian Meilicke, Johanna Völker, and Heiner Stuckenschmidt. Learning disjointness for debugging mappings between lightweight ontologies. In *Proceedings of EKAW* 2008, pages 93–108, 2008.
- Hellmann S, Lehmann J, and Auer S. Learning of owl class expressions on very large knowledge bases and its applications. *Interoperability Semantic Services and Web Applications*, pages 104–130, 2011.
- Gerald Töpper, Magnus Knuth, and Harald Sack. Dbpedia ontology enrichment for inconsistency detection. In *Proceedings of I-SEMANTICS 2012*, pages 33–40, 2012.
- Johanna Völker and Mathias Niepert. Statistical schema induction. In *Proceedings of ESWC 2011*, pages 124–138, 2011.
- Johanna Völker, Denny Vrandečić, York Sure, and Andreas Hotho. Learning disjointness. In *Proceedings of ESWC* 2007, pages 175–189, 2007.
- Man Zhu, Zhiqiang Gao, Jeff Z. Pan, Yuting Zhao, Ying Xu, and Zhibin Quan. Thox learning from incomplete data by inference in belnet⁺. *Knowledge-Based Systems*, 75(5):30–40, 2015.