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Ontology Learning from Interpretations in Lightweight Description Logics

Szymon Klarman¹ and Katarina Britz²

¹ Department of Computer Science, Brunel University London

² CSIR Centre for Artificial Intelligence Research, South Africa

Abstract

Data-driven elicitation of ontologies from structured data is a well-recognized knowledge acquisition bottleneck. The development of efficient techniques for (semi-)automating this task is therefore practically vital, yet, hindered by the lack of robust theoretical foundations. In this paper, we study the problem of learning Description Logic TBoxes from interpretations, which naturally translates to the task of ontology learning from data. In the presented framework, the learner is provided with a set of positive interpretations (i.e., logical models) of the TBox adopted by the teacher. The goal is to correctly identify the TBox given this input. We characterize the key constraints on the models that warrant finite learnability of TBoxes expressed in selected fragments of the Description Logic EL and define corresponding learning algorithms.