

From Complete to Incomplete Data and Back in Ontology-Enriched Databases

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Abstract. Enriching a database with a background theory expressing domain knowledge, usually called an ontology, has been proposed as a tool to overcome the incompleteness of data. In ontology mediated querying the theory is used to infer answers that may involve implied facts not present in the data. This and other related reasoning problems have been extensively studied over the last decade, mostly for ontologies written in description logics and in dialects of Datalog[±]. But the usual first-order semantics used in this setting, which assumes that all data is incomplete, can sometimes be too weak and not give all expected answers. I will discuss some alternatives that have been explored for combining complete and incomplete data in the presence of description logic ontologies, and the challenges that they pose, including increased computational complexity of reasoning and non-monotonicity of the ontology mediated query languages they induce. I will discuss a few interesting reasoning problems that arise in these setting, and some translations from these query languages into variants of Datalog.