Acquisition and Validation of Complex Object Database Schemata Supporting Multiple Inheritance*

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Abstract

We present an intelligent tool for the acquisition of object oriented schemata supporting multiple inheritance, which preserves taxonomy coherence and performs taxonomic inferences. Its theoretical framework is based on *terminological logics*, which have been developed in the area of artificial intelligence. The framework includes a rigorous formalization of complex objects, which is able to express cyclic references on the schema and instance level; a *subsumption* algorithm, which computes all implied *specialization* relationships between types; and an algorithm to detect *incoherent* types, i.e., necessarily empty types. Using results from formal analyses of knowledge representation languages, we show that subsumption and incoherence detection are computationally intractable from a theoretical point of view. However, the problems appear to be feasible in almost all practical cases.

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