Schmidt-Schauß, Manfred

Subsumption in KL-ONE is undecidable. (English) Zbl 0709.68096


Summary: [For the entire collection see Zbl 0699.00013.]

It is shown that in the frame-based language KL-ONE it is undecidable whether one concept is subsumed by another concept. In fact a rather small sublanguage of KL-ONE called ALR is used which has only the concept forming operators conjunction, value restriction, and role value maps using only ‘=’. In particular, number restrictions are not used. The language ALR can be viewed as an extension of feature terms without complements and unions, where features have sets as values instead of elements. Our result shows that there is a basic difference between feature terms and KL-ONE, since the complexity of subsumption switches from quasi-linear to undecidable if the restriction is dropped that roles are functional.

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knowledge representation language; frame-based language; undecidable