

Modeling Error Explanation

Petr Křemen

1 Explanation Algorithms

1. Consider an \mathcal{ALC} theory $\mathcal{K} = (\{\alpha_1, \alpha_2, \alpha_3, \alpha_4\}, \emptyset)$:

$$\begin{aligned}\alpha_1 & : A \sqsubseteq \forall R \cdot \neg B, \\ \alpha_2 & : B \sqsubseteq \perp \\ \alpha_3 & : C \sqsubseteq A \sqcap \exists R \cdot B. \\ \alpha_4 & : D \sqsubseteq C\end{aligned}$$

Use the Reiter algorithm to answer the following questions:

- Find all MUPSeS for unsatisfiability of the concept C .
 - Find all minimal diagnoses for unsatisfiability of the concept C .
 - How many runs of the tableau algorithm were necessary for each case?
 - Check your results using Protégé explanation functionality.
2. Repeat the previous exercise using the CS-tree algorithm.

2 Modeling Error Explanations Practically

1. Download and set up the Pellet system (see previous seminar).
2. Download the Pizza ontology.
3. Find all explanations for unsatisfiability of `IceCream` using Pellet system (command `explain`).
4. Explanations can be used not only for unsatisfiability, or consistency, but for any entailment. Try to explain selected axioms in the class hierarchy according to your choice (Pellet switch `--hierarchy`)