

Reasoning With Bounded Self-Reference Using Logical Interpreters

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$ALCQ_{me_2}$ – $ALCQ$ with 2-bounded self-reference

The narcissist:

$I.\exists \text{ loves. me}$
one \forall/\exists between I and me (easy)



The celebrity:

$I.\forall \text{ meets. } \exists \text{ knows. me}$
two \forall/\exists between I and me (easy)



~~The step-parent:~~

~~$I.\exists \text{ marriedTo. } \exists \text{ hasChild.}$
 $\exists \text{ hasParent. } \neg \text{me}$
three \forall/\exists between I and me (hard)~~



- \mathcal{ALCQme}_2 is expressive and of low complexity
 - $\mathcal{ALCQme}_2 \approx \mathcal{ALCHIQb} + \exists R. \text{Self}$
 - Can express role connectives: $R \sqcap S$, $R \sqcup S$, $R - S$
 - EXPTIME-Complete for TBox-reasoning
- But off the shelf reasoners can not handle it
 - \Rightarrow visit our poster and see how this part is fixed!