

Exploring Semantic Hierarchies to Improve Resolution Theorem Proving on Ontologies

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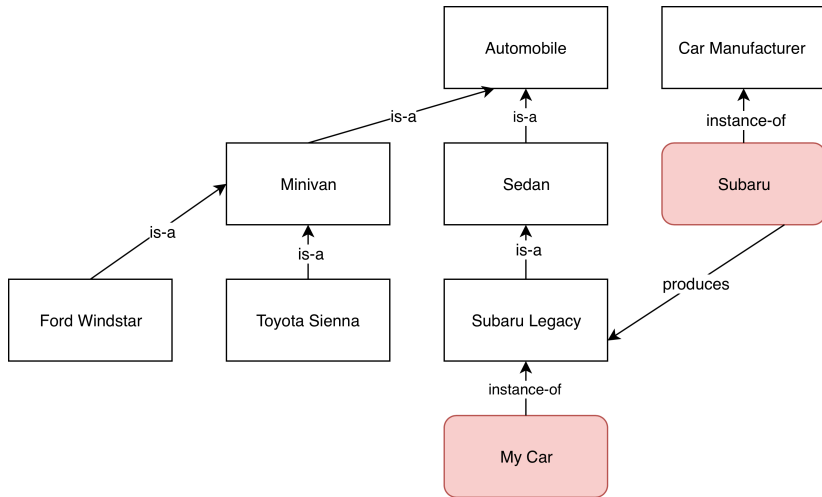
April 30, 2019

Agenda

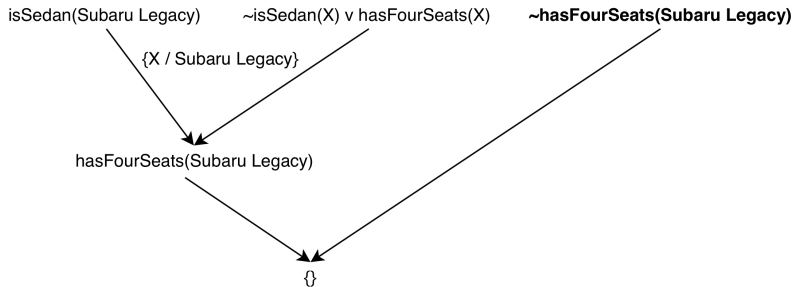
Defense (2.5 Hours)

- ▶ Honors Thesis (1 Hour)
 - ▶ Presentation (20 min)
 - ▶ Questions (40 min)
- ▶ Honors Reading List (1 Hour)
 - ▶ Reading List Description (5 min)
 - ▶ Reading List Discussion (55 min)
- ▶ Committee Deliberation (30 min)
 - ▶ Level of honors discussion
 - ▶ Suggestions for Revision

Ontologies



Theorem Proving



Semantic Hierarchies

Class hierarchy:

Asserted

- owl:Thing
 - biological_process
 - cellular_component
 - 'axon part'
 - 'axoneme part'
 - 'bacterial-type flagellum part'
 - 'biofilm matrix component'
 - cell
 - 'cell cortex part'
 - 'cell division site part'
 - 'cell junction'
 - 'cell part'
 - 'cell projection part'
 - 'cell septum part'
 - 'cell wall part'
 - 'chloroplast part'
 - 'chromosomal part'
 - 'ciliary part'
 - 'collagen and cuticulin-based cuticle ext'
 - 'contractile fiber part'
 - 'cytoplasmic part'

Annotation property hierarchy Datatypes

Data property hierarchy Individuals by type

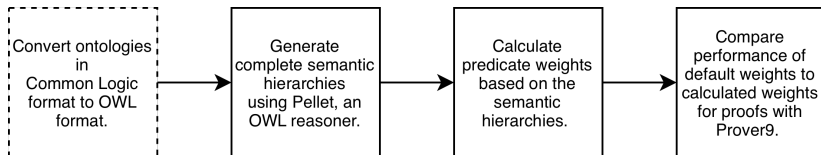
Object property hierarchy

Object property hierarchy:

Asserted

- owl:topObjectProperty
 - aboral_to
 - adjacent_to
 - immediately_anterior_to
 - immediately_deep_to
 - immediately_posterior_to
 - immediately_superficial_to
 - 'anastomoses with'
 - anterior_to
 - attaches_to_part_of
 - 'bearer of'
 - 'boundary of'
 - 'channel for'
 - channels_from
 - channels_into
 - 'child nucleus of'

Approach



Functions

Results

Limitations

$(\text{all } x \text{ all } y (\text{GED}(x,y) \ \& \ \text{GED}(y,x) \ \& \ (\text{all } z (\text{CH}(z,x) \rightarrow \text{CH}(z,y))) \rightarrow \text{CS}(x,y)))$.

Questions