Exploring Semantic Hierarchies to Improve Resolution Theorem Proving on Ontologies

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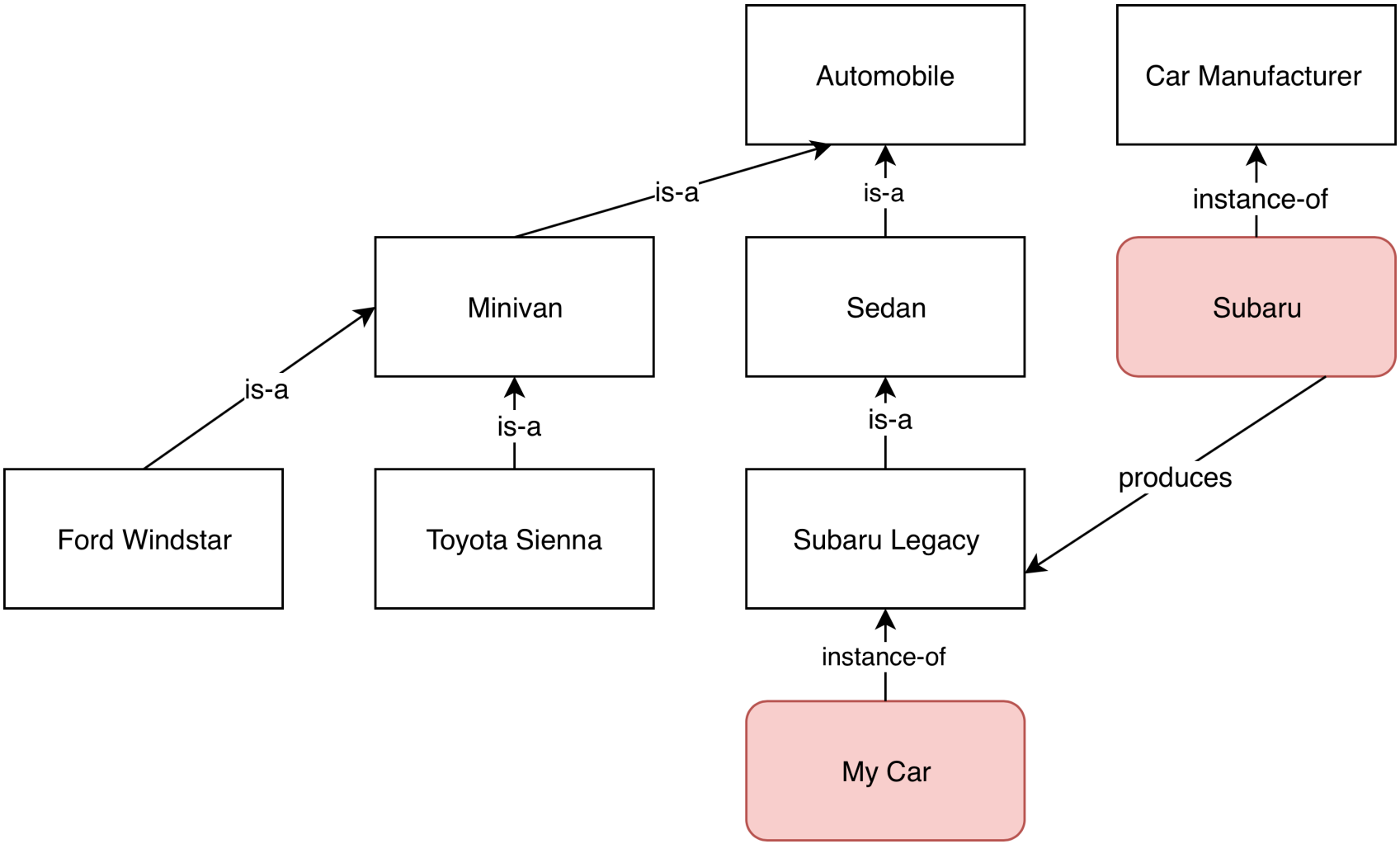
April 30, 2019

Agenda

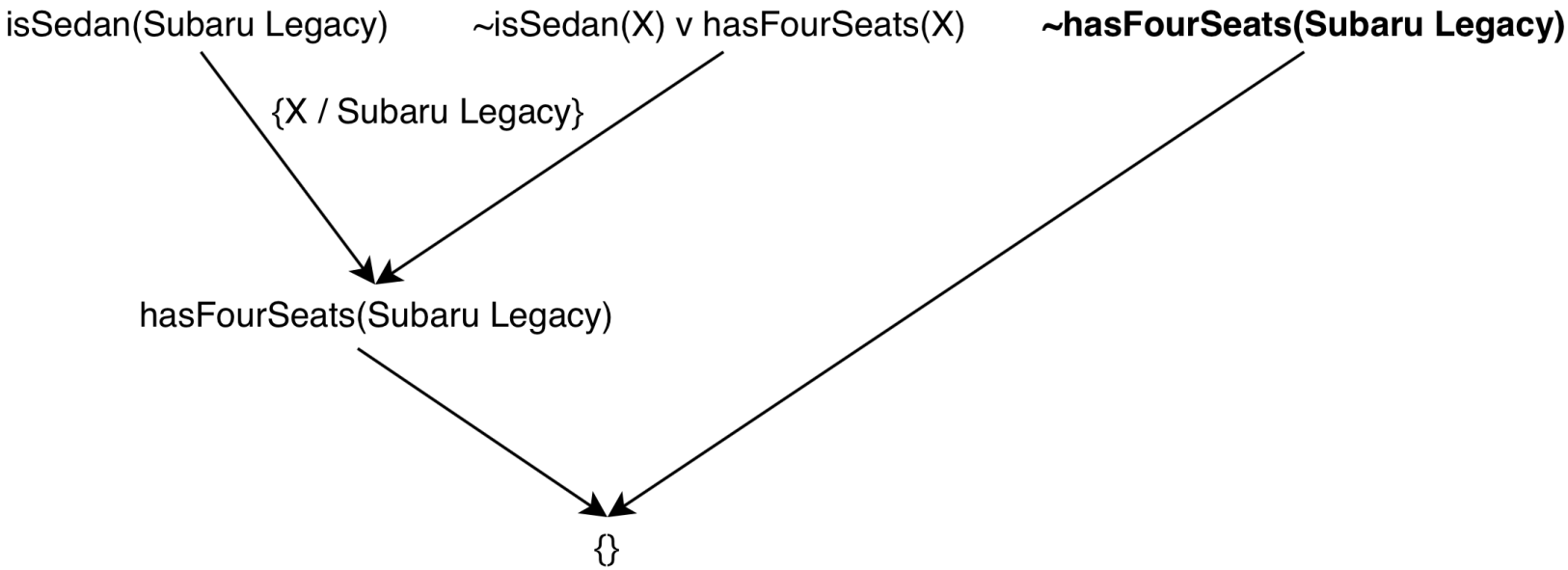
Defense (2.5 Hours)

- 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

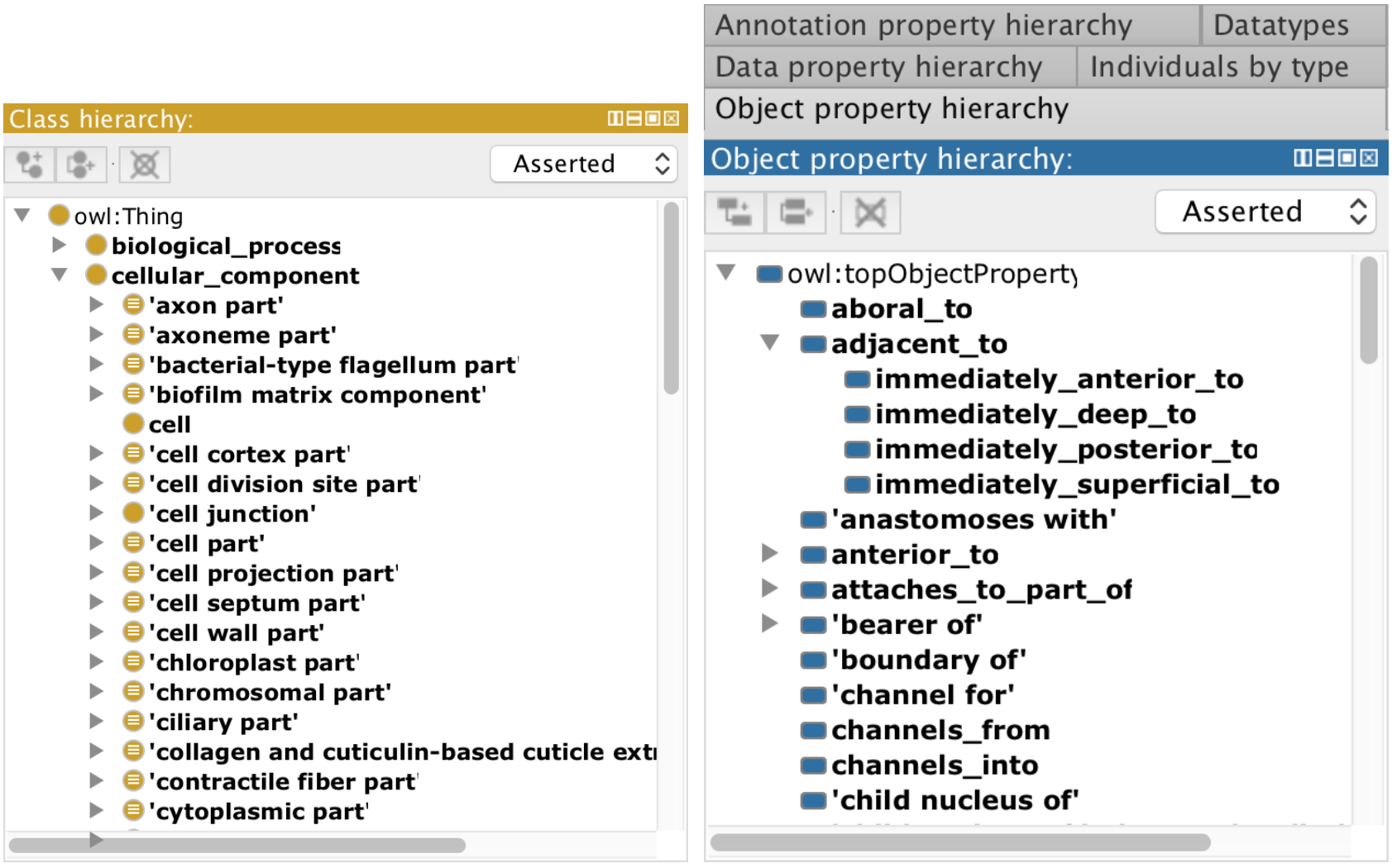
Ontologies


Automobile
Car Manufacturer
is-a
is-a
instance-of
Minivan
Sedan
Subaru
is-a
is-a
is-a
produces
Ford Windstar
Toyota Sienna
Subaru Legacy
instance-of
My Car

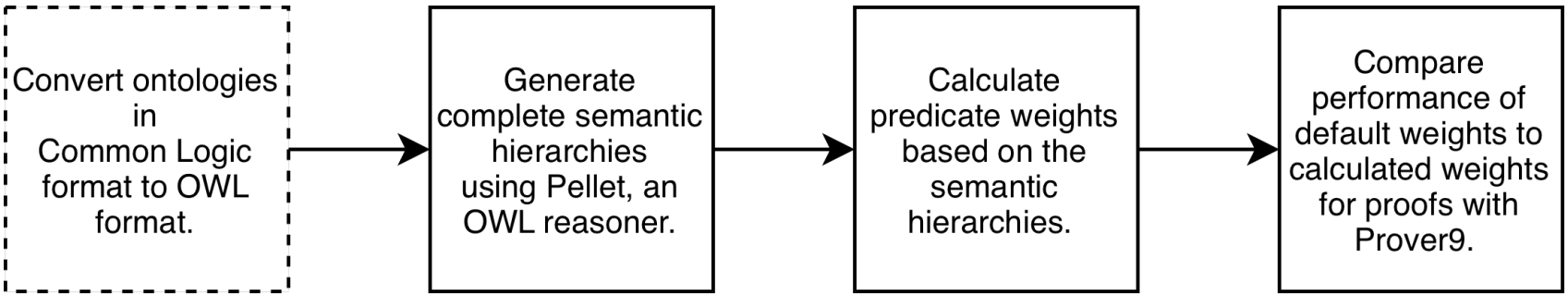
Theorem Proving



Semantic Heirarchies



Approach


Convert ontologies in Common Logic format to OWL format.
Generate complete semantic hierarchies using Pellet, an OWL reasoner.
Calculate predicate weights based on the semantic hierarchies.
Compare performance of default weights to calculated weights for proofs with Prover9.

Functions

Results

Limitations

```
(all x all y (GED(x,y) & GED(y,x) & (all z (CH(z,x)
-> CH(z,y))) -> CS(x,y))).
```

Questions