Argumentation and Negotiation: Semantic Web Applications

COST Panel Session at COMMA'10

Anthony Hunter (UCL)

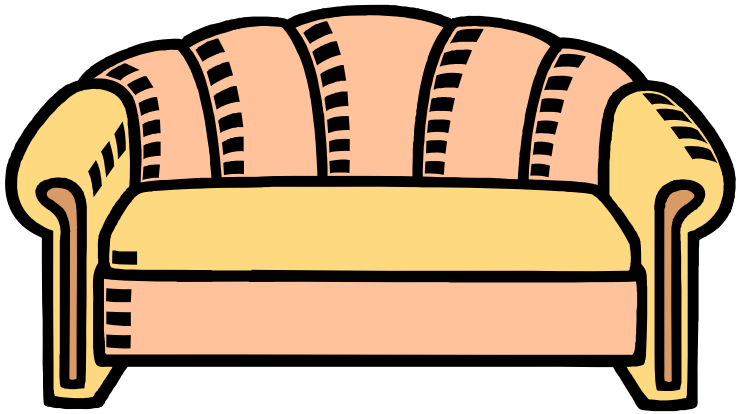
with contributions from Liz Black (Utrecht)
and Jeff Pan (Aberdeen)

Some issues

- What is the semantic web?
- Information on the web is inconsistent and incomplete
- Most information is textual
- Meta-information is meant to help but that is also inconsistent and incomplete

Ontological problems: Synonyms

Sofa?

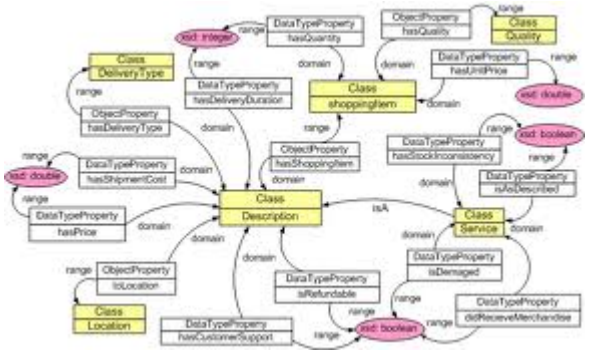


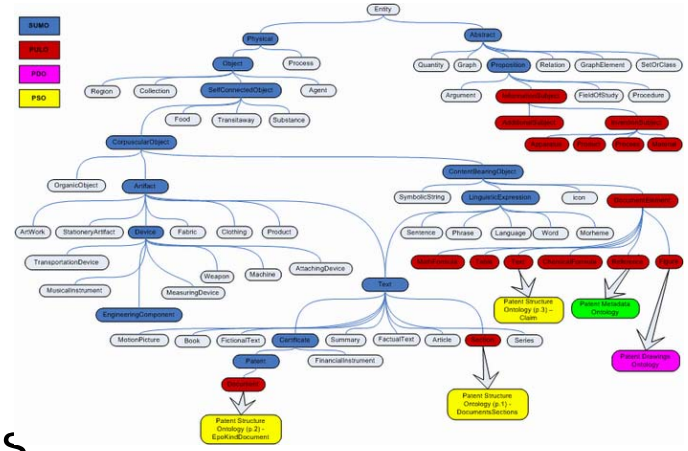
Couch?

Ontological problems: Homonyms

Plane?

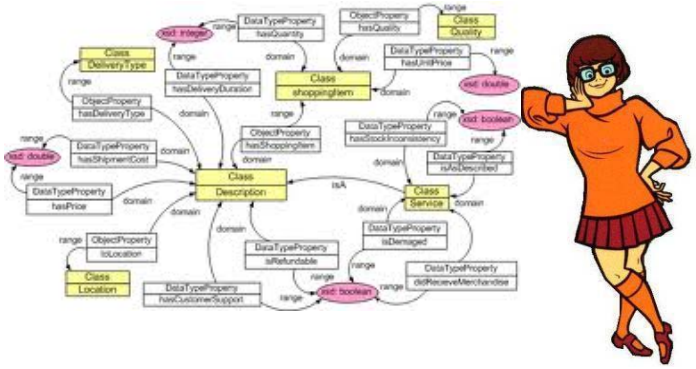
Problems of multiple ontologies

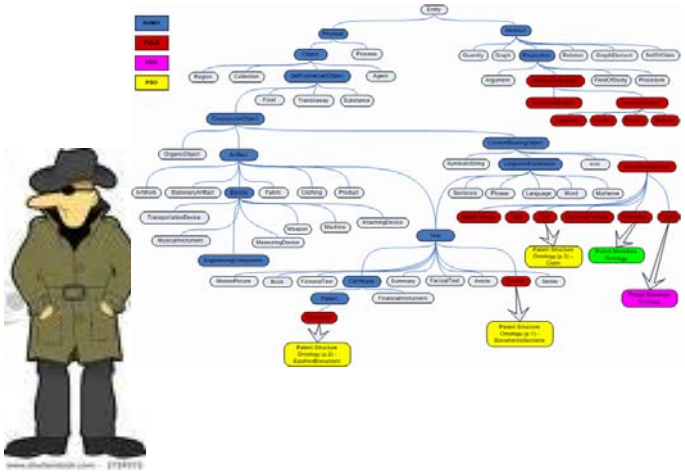




- Different sources use different ontologies
- Not practical to reconcile ontologies or to have a web standard
- Ontologies are a form of IP and so undesirable to reveal too much about them
- Yet desirable for some interaction between websites according to some ontology
- Not necessary to deal with whole ontology

Argumentation with ontologies





- Each ontology has an associated agent that acts as an intermediary
- If a website wants to know how another website deals with some part of the ontology, they can enter into a dialogue.
- If there is disagreement between them, they can argue.

Our proposal

“U” is for undercut

- Use a small set of types of dialogue move for argumentation.
- Content of arguments based on ontologies plus a lexbase (which is a set of mappings between ontologies).
- Our system is sound and complete with respect to union of agents’ ontologies plus lexbase.
- Advantage that you don’t need to copy all of each ontology to each agent.
- Just enough knowledge is exchanged in the posit and concede moves for the argument trees to be implicitly constructed.

Problems of using argumentation

- The world of ontologies and description logics is large and complex. Therefore, it is difficult to gain sufficient understanding to be able to make a demonstrable contribution
- The world of argumentation is somewhat underdeveloped for providing solutions to real data+knowledge engineering problems.

Questions for real-world applications of argumentation

- What does argumentation give the user?
- Is solving a dialectical conundrum an important problem for users?
- Should we do more about the content of arguments rather than the conflict between arguments?
- How do we map real-world info into content for arguments?
- Should we do more to relate computational models of argumentation to computational linguistics (semantics and pragmatics)?