

Agreement Technologies



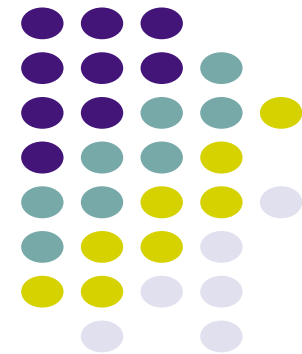
 **COST Action IC0801**

Semantics in Agreement Technologies

Editors: *Antoine Zimmermann, George Vouros, Axel Polleres*

Presented by: **Antoine Zimmermann**

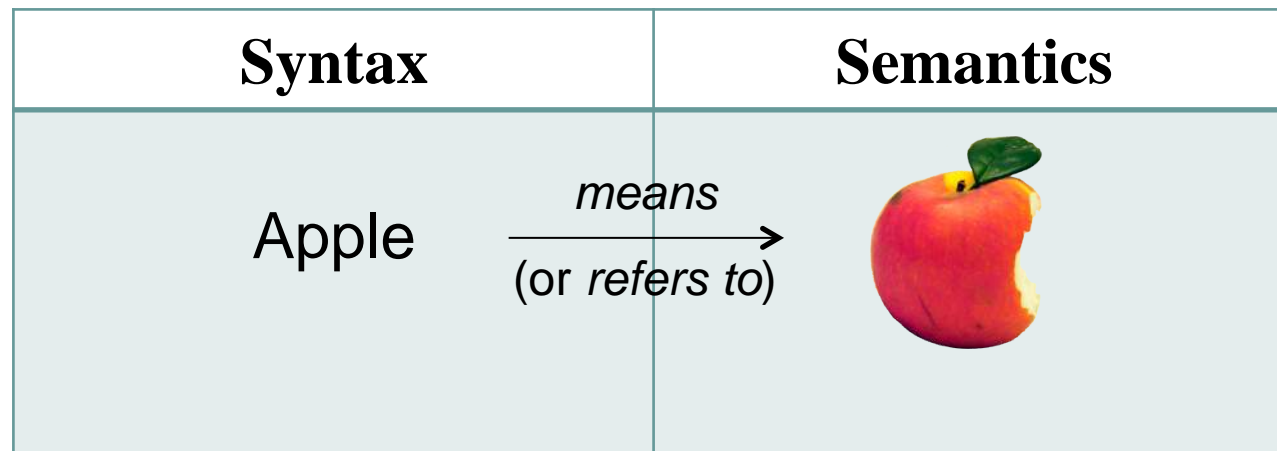
<http://www.agreement-technologies.eu>



Semantics



- Originally, semantics is the study of meaning
- Semantics defines the relationship between symbols and what they denote



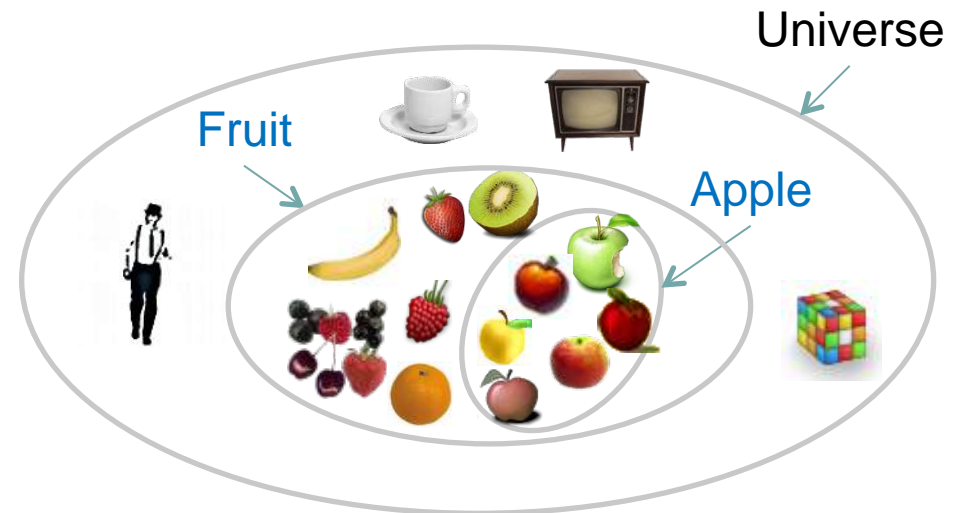
Semantics in computer science



- Formal semantics does not give access to the true meaning of symbols;
- Formal semantics only constrain how a symbol can possibly be interpreted;
- This allows computer systems to make automatic deductions.

$Apple \subseteq Fruit$
 $Granny-Smith \in Apple$

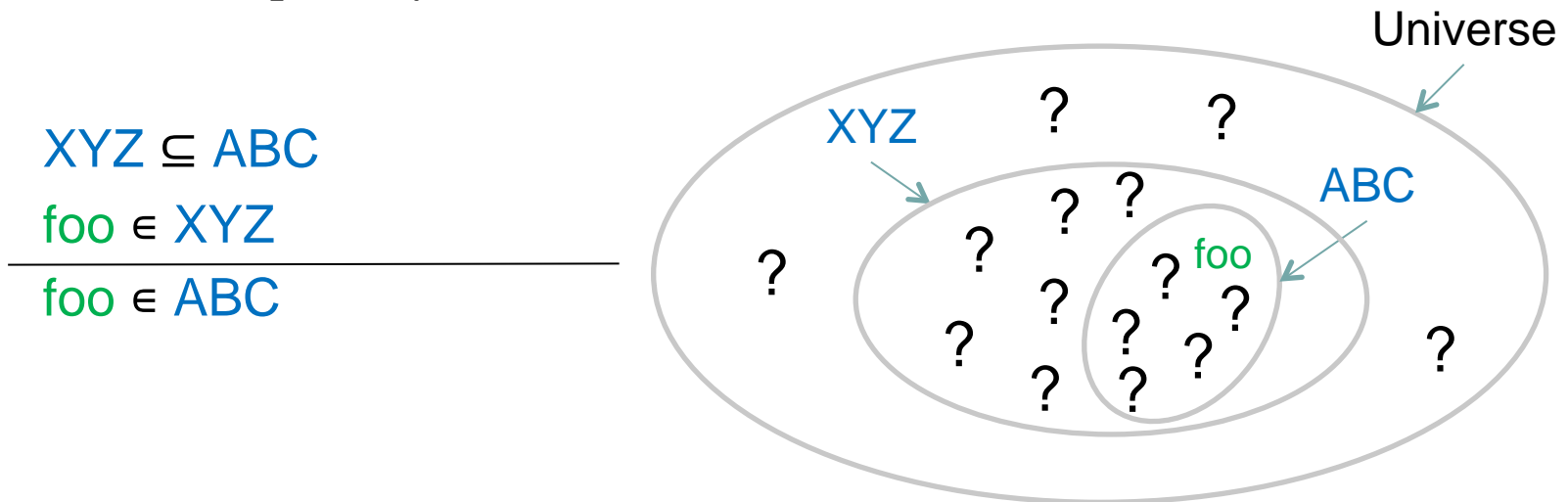
 $Granny-Smith \in Fruit$



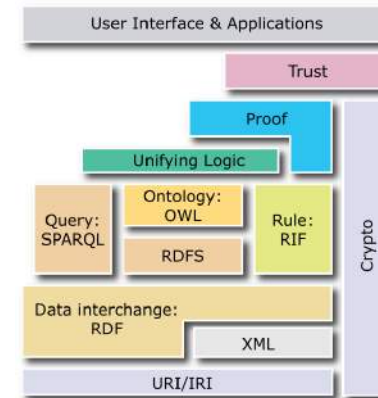
Semantics in computer science



- Formal semantics does not give access to the true meaning of symbols;
- Formal semantics only constrain how a symbol can possibly be interpreted;
- This allows computer systems to make automatic deductions.



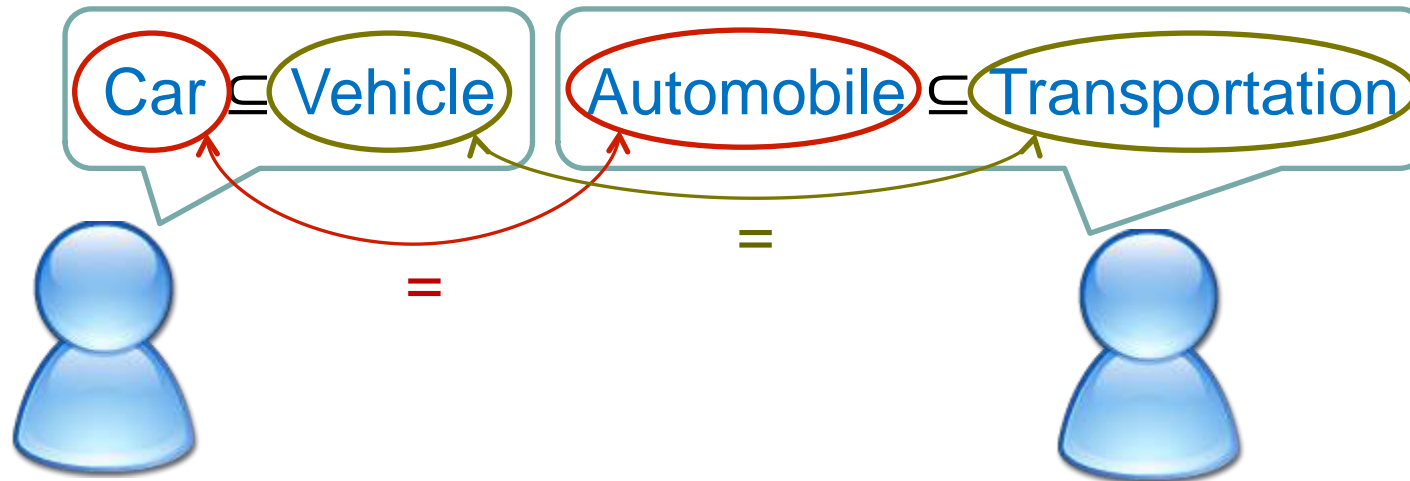
Agreeing on a formal semantics



- Brings standards from the W3C:
 - A common data model: **RDF**
 - Ontology languages: **RDFS** and **OWL**
 - Rule interchange format: **RIF**
 - Query language: **SPARQL**

All of those have a *standard* formal semantics

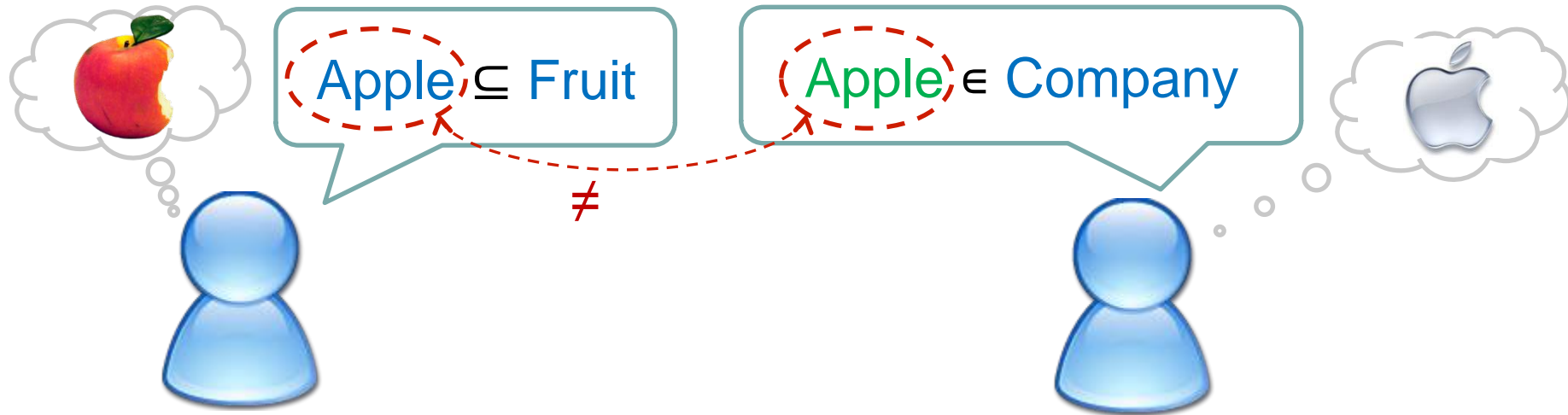
Standard formats but different ontologies...



To produce useful inferences with heterogeneous knowledge, ontologies must be **aligned**, i.e., **correspondences** must be found

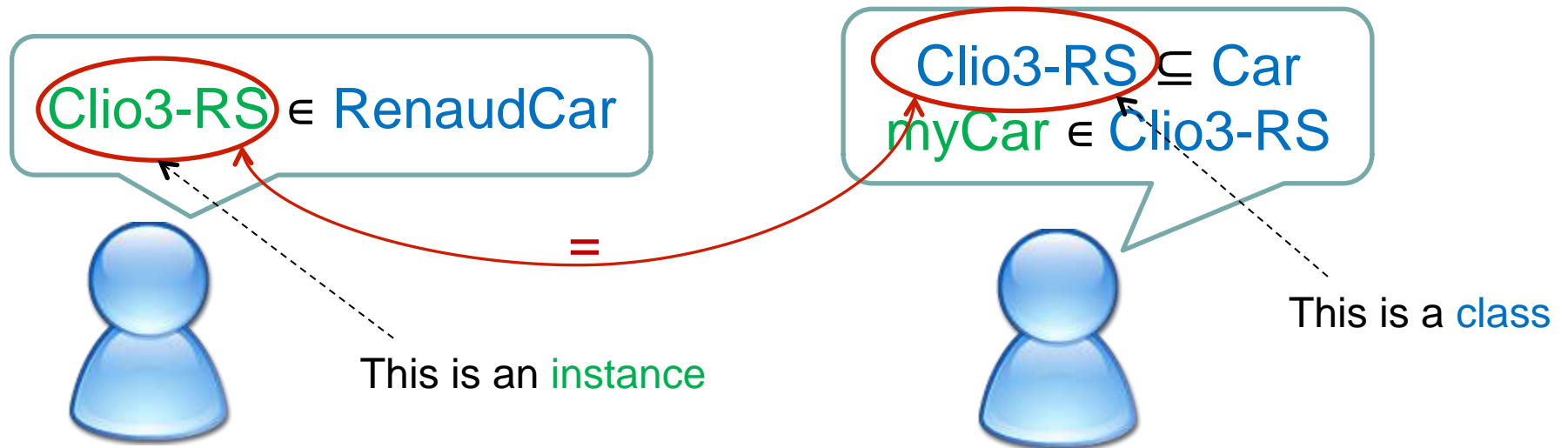


...different meanings



The same symbol does not always mean the same thing

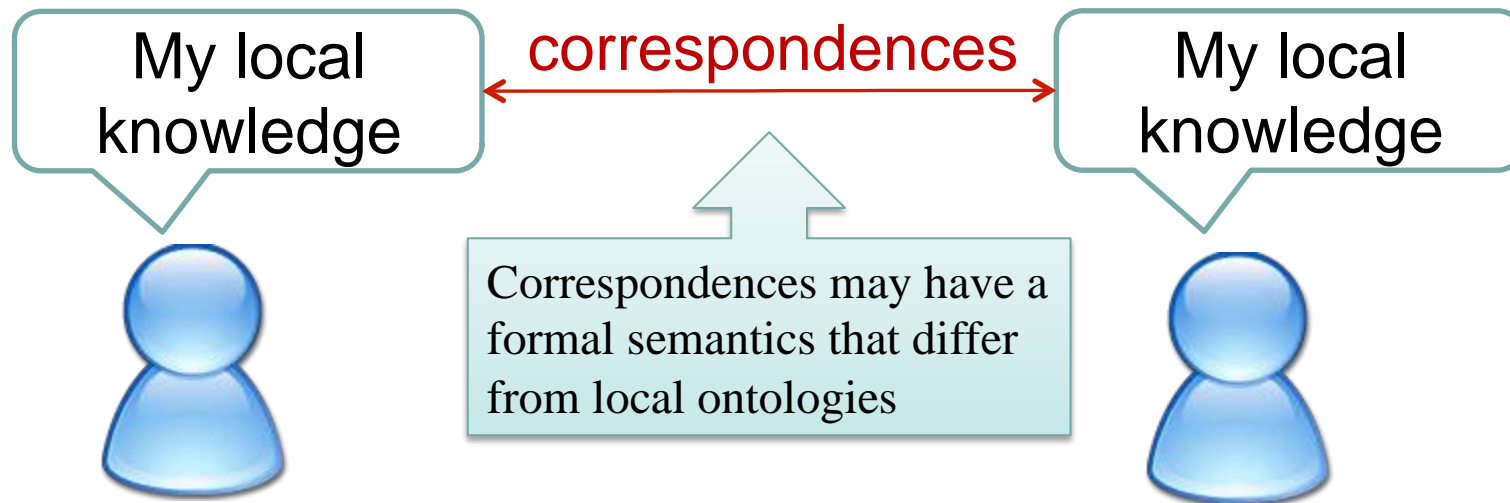
...different modelling



Different granularity, different level of abstraction, different viewpoint, etc. Yet the correspondance *is correct in intension*

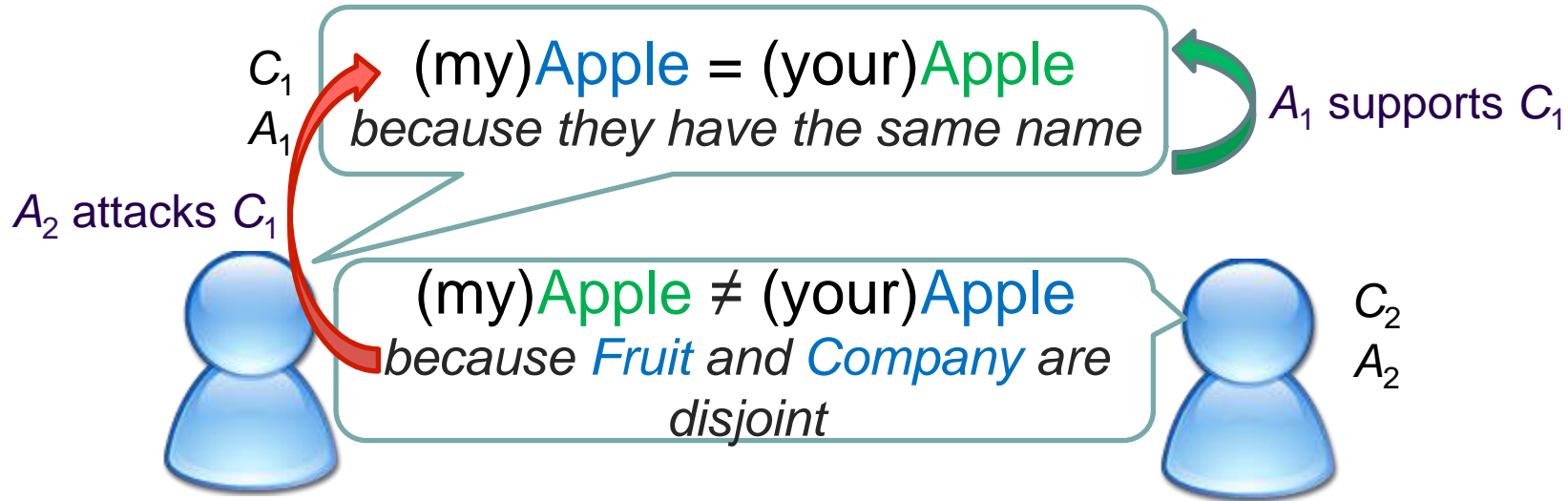


Contextual reasoning



Reasoning with multiple contexts (beliefs, viewpoints, etc) requires *non standard reasoning* techniques. Truth can differ between contexts.

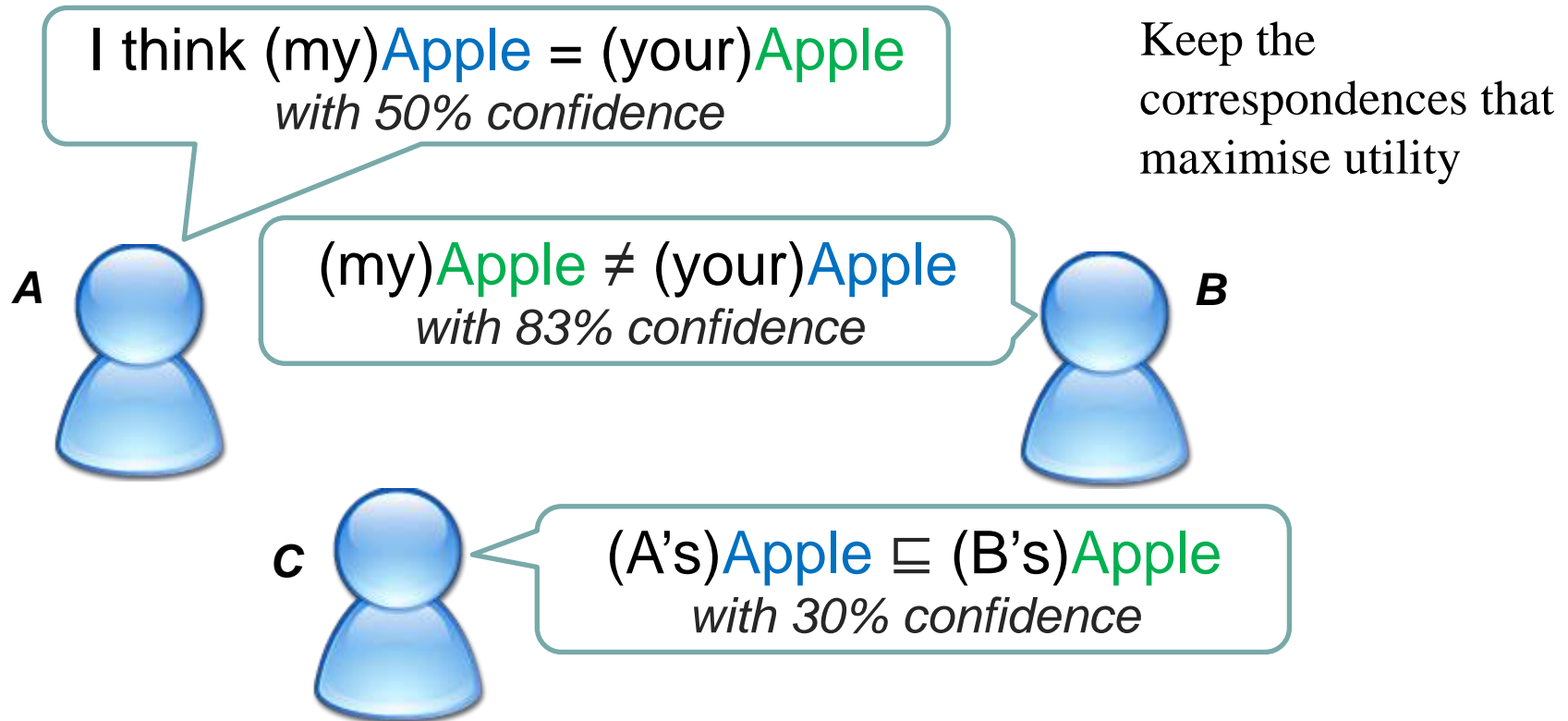
Ontology alignment through argumentation



Ontologies are aligned by an exchange of arguments



Alignment with constraint optimisation



more information in the Agreement Technologies book



In this book, you will find details about:

- Semantic Web technologies in Agreement Technologies
- Logical formalisms for distributed and heterogeneous knowledge
- Ontology matching techniques for reaching semantic agreement
- Use cases of semantic technologies in the context of Agreement Technologies:
 - in multi-agent systems for e-commerce;
 - in Semantic Web service match making;
 - in resource management for Grid computing.