A communication protocol for semantic heterogeneity with incomplete ontology alignment

Laurent Mazuel & Nicolas Sabouret
Laboratoire Informatique de Paris 6, 104 av du Président Kennedy, 75016, Paris, France
email: laurent.mazuel@spim.jussieu.fr, nicolas.sabouret@lip6.fr

Semantic heterogeneity

A multi-agent protocol to deal with semantic heterogeneity

Evaluation

Implementation

Evaluation parameters:

- $T$: number of 1st depth nodes
- $S$: number of 2nd depth nodes
- $N$: number of abilities
- $P_{\text{ont}}$: ontologies intersection ratio
- $P_{\text{match}}$: abilities intersection ratio

Our approach is efficient:

- if ontologies share little information (i.e. $P_{\text{ont}}$ is low)
- if the abilities are not too similar (i.e. $P_{\text{match}}$ is low)

For instance:

$P_{\text{ont}} = 0.1$ and $P_{\text{match}} = 0.2$: 80% of solved requests

Definition:

Request: set of concepts from ontology 1 which represents a request from agent 1

Ability: set of concept from ontology 2 which is a possible action of agent 2

Scoring abilities: compute the correspondence ratio between a request and an ability

$$\text{sim}(S_{\text{req}}, S_{\text{ab}}) = \max_{S \in R(S_{\text{req}} \cap S_{\text{ab}})} \left( \sum_{x, y \in S} \text{sim}_{\text{ONT}}(x, y) \right)$$