Agreement Maintenance Based on Schema and Ontology Change in P2P Environment

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Outline

- Background / Motivation
- Challenge
- General Approach
- Testing
- Results
- Conclusion
Background / Motivation

- Internet is huge.
- Sources in internet has many diversity.
- Difficult to find appropriate sources.
- Current search engines are for multiple domain/community, so misperception of concept is high.
Peer to Peer Approach

Comon Ontology
(Metadata of Sources)

Concept Adjustment

Local Scheme

Query

Peer-n (request)

Peer-m (provider)
Both sources must give relevant information.
Query: SEARCH job where grade = 'bachelor';
Illustration (change)

Query: SEARCH job where grade = 'bachelor';
Challenge

- Detect changes of data sources.
- Calculate how big the changes.
- Maintain the semantic agreement for better querying.
- Reduce computing cost in Semantic Agreement Maintenance.
General Approach

1. Detecting the changes of Common Ontology and Local Scheme (based on versioning)
2. Calculating how big the changes
3. Choosing an appropriate algorithm of maintenance
4. Do the agreement maintenance

End
General Approach

- Detecting the changes of Common Ontology and Local Scheme (based on versioning)
General Approach

- Detecting the changes of Common Ontology and Local Scheme (based on versioning)

File: LS

File: LS20071029
General Approach

- Calculating how big the changes = PromptDiff Algorithm
General Approach

- Choosing an appropriate algorithm of maintenance

Diagram:

1. Weighting
2. Border Value Definition
3. Choosing the Algorithm
General Approach

- Do the agreement maintenance

Simple Algorithm

- Label Matching (JCN)

Complex Algorithm

- Label Matching (JCN)
  - Internal Structure
  - External Structure
Testing

- Modify (add, delete, rename) the Local Scheme (class & property)
- Calculate the changes by using PromptDiff (from PROMPT TAB tool)
- Choose an algorithm based on value from step 1
- Make an agreement from two algorithms
- Calculate Recall, Precision, and F-Measure from algorithm and expert
Results

If the complex algorithm should be used, so the F-measure of it is always greater than the simple algorithm.

If the simple algorithm should be used, so the F-measure of the complex algorithm is relatively equal with the F-measure of the simple algorithm.

In many cases, the F-measure of the simple algorithm is 2% better.
Conclusion

- Choosing an appropriate algorithm is very important to reduce computing cost.
- More modification of Common Ontology and Local Scheme makes the F-Measure value worse.
Thank You