Discovering Alignments in Ontologies of Linked Data

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Motivation

Data Integration on the Web
- There is a need for the interoperability of information from different sources on the Web
- This involves joining data at the - Object Level - Schema Level

The Semantic Web Community is Linking Different Sources at the Object Level

However, Not Many Sources have Links at the Schema Level

- Sources may have poor ontologies
- Need expressive alignments (not just 1-to-1 class matches)

Problem is Non-Trivial

Approach

Align Concepts when Supported by Evidence at the Object Level

Create New Concepts to Overcome the Rudimentary Ontology Problem

- Atomic Restriction Classes
- Conjunctive Restriction Classes
- Disjunctive Restriction Classes

Find Concept Coverings by Aligning Disjunctive Restriction Classes with Atomic Restriction Classes

Results

Example Alignments of Atomic Restriction Classes

- Larger Restriction Classes
- Unique of Smaller

Example Alignments of Conjunctive Restriction Classes

- Larger Restriction Classes
- Unique of Smaller

Example Concept Coverings

- Larger Restriction Classes
- Unique of Smaller

Detection of Outliers: Objects that contradict the overwhelming evidence of the alignment may have wrong links or values