Session-based Ontology Alignment

Patrick Lambrix, Rajaram Kaliyaperumal

Department of Computer and Information Science, and Swedish e-Science Research Centre, Linköping University, Linköping, Sweden

Introduction

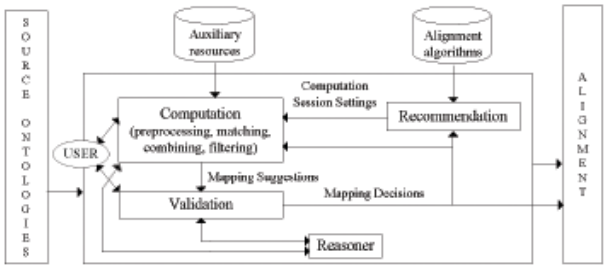
In recent years many ontologies have been developed. The benefits of using ontologies include reuse, sharing and portability of knowledge across platforms, and improved documentation, maintenance, and reliability. Ontologies lead to a better understanding of a field and to more effective and efficient handling of information in that field. Many of the currently developed ontologies contain overlapping information. For instance, Open Biological and Biomedical Ontologies lists circa 40 different ontologies in the anatomy domain (April 2012). Often we want to use multiple ontologies. For instance, applications may need to use ontologies from different areas or from different views on one area. Further, the data in different data sources in the same domain may have been annotated with different but similar ontologies. Knowledge of the inter-ontology relationships would in this case lead to improvements in search, integration and analysis of data. It has been realized that this is a major issue and much research has recently been done on ontology alignment, i.e. finding mappings between terms in different ontologies.

In this poster we tackle the problem of aligning large ontologies where the mappings suggested by the ontology alignment system need to be validated. In contrast to the case of small ontologies, the computation of mapping suggestions can take a long time and therefore, we would like to be able to start the validation before every mapping suggestion is computed. Further, it is clear that for large ontologies, in general, there are too many mapping suggestions to validate in one time. Therefore, we want a system that allows to partially validate the mapping suggestions and resume the validation later. However, whenever validation decisions have been made, they increase our knowledge about the ontologies and mappings and this knowledge can be used to provide better mapping suggestions.

Results

In the poster we present an iterative alignment framework that introduces the notions of computation, validation and recommendation sessions. During the *computation sessions* mapping suggestions are computed. During the *validation sessions* the user validates the mapping suggestions generated by the computation sessions. During the *recommendation sessions* the system computes recommendations for which algorithms may perform best for aligning the given ontologies.

Further, we implemented a prototype based on this framework. To our knowledge, this is the first implemented ontology alignment system that allows a user to interrupt and resume the different stages of the ontology alignment tasks. It also provides solutions for several of the main challenges in ontology alignment, i.e. large-scale ontology matching, efficiency of matching techniques, matching with background knowledge, matcher selection, combination and tuning, and user involvement. The system has been tested using Anatomy ontologies used in the Ontology Alignment Evaluation Initiative.



References

Lambrix P, Kaliyaperumal R, Session-based Ontology Alignment, *submitted*.

Lambrix P, Tan H, SAMBO - A System for Aligning and Merging Biomedical Ontologies, *Journal of Web Semantics*, 4(3):196-206, 2006.

Correspondence: Patrick.Lambrix@liu.se