

OWLS-SLR LITE

SME2 PLUGIN

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OWLS-SLR¹ [1] (SLR stands for Structural and Logic-based Reasoning) is a semantic Web service matchmaker written in Java that makes use of OWL-S Profiles. It follows the abstract Web service discovery approach, performing matchmaking based on inputs, outputs and non-functional properties. The matchmaking algorithm exploits not only the ontology subsumption hierarchy, but also the structural knowledge of the domain ontologies, such as sibling relationships among concepts.

OWLS-SLR adopts a conceptual model [2], following the WSMO Discovery Framework [3] and using descriptions that are expressed as instances of the Profile concept of the Service Profile of the OWL-S 1.1 [4] ontology. Some of its main features include:

- **Taxonomy-based matchmaking.** OWLS-SLR allows the existence of a Profile Taxonomy², that is, a subclass hierarchy of the OWL-S Profile concept. This is feasible by performing complete ABox DL reasoning on OWL-S advertisements and queries that are both represented as direct or indirect Profile ontology instances. OWLS-SLR has been defined on top of the Pellet DL reasoner [5].
- **Structural ontological knowledge.** OWLS-SLR implements two concept distance measures, namely the edge distance and the upwards cotopic [6] distance. The former computes the distance of two concepts based on the number of edges found on the shortest path between them. The latter determines the similarity of two ontology concepts taking into account the ratio of the common superclasses of the two concepts. In that way, we are able to match concepts not based only on logic-based reasoning, but also on the structural knowledge that the ontology provides, returning useful matchmaking results.
- **Role-oriented matchmaking.** OWLS-SLR allows the annotation of the input and output parameters of the Profile concept with ontology roles. This is achieved by extending the Input and Output OWL-S concepts and exploiting the excellent classification capabilities of DL reasoning that is based on anonymous concept definitions. The rationale behind this direction is to allow the ontology roles to play an important role during matchmaking, since they encapsulate important domain knowledge.

¹ <http://lpis.csd.auth.gr/systems/OWLS-SLR/>

² <http://www.daml.org/services/owl-s/1.1/ProfileHierarchy.html>

- **Filtering:** The functionality of OWLS-SLR is characterized by a number of filters that allow users to control the matchmaking results according to the application domain and their preferences.

For the purpose of the S3 contest, we have released OWLS-SLR Lite, a light version of the OWLS-SLR matchmaker that does not take into account any Profile taxonomy and does not perform role-based matchmaking, since the OWLS-TC collection that is used does not provide this knowledge. Therefore, the matchmaking is performed based only on the I/O annotations using either the edge distance or the upwards cotopic distance.

The submitted plugin for SME2 contains three configurations for OWLS-SLR Lite. The first one uses the edge distance and it does not take into account the sibling relationships (structural knowledge) among the concepts during matchmaking. The second one takes into account the sibling relationships and computes the concept distances based on the upwards cotopic measure. Finally, the third configuration is similar to the second one, using the edge distance for computing the concept similarities.

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