A New Ontology Lookup Service at EMBL-EBI

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The use of bio-medical ontologies for the annotation, integration and analysis of biological data is now well established in bioinformatics. The range and diversity of ontologies has increased dramatically over the last ten years and community efforts such as the OBO foundry have been instrumental in coordinating this activity. The demand for unified mechanisms for accessing large collections of ontologies has lead to a number of dedicated ontology repositories becoming available to the community. The EMBL-EBI Ontology Lookup Service (OLS)[1] was one of the earliest public ontology browsers, offering searching and browsing services along with Web services for programmatic access to ontologies. Similar services are offered by other ontology repositories, such as BioPortal[2] and OntoBee[3], that are notable for their support for the Web Ontology Language (OWL). Support for OWL in OLS has not been available until now.

The prevalence of bio-medical ontologies published in OWL along with changes to the OBO format (to the point where it is now considered a subset of OWL) has necessitated a re-engineering of the OLS system to support this established standard. This has been coupled with an increasing demand for ontology-based services within EMBL-EBI as the role of ontologies becomes integral to the interoperability of data across the institute. In order to meet his demand the OLS has been redesigned and aims to better connect the ontologies to the data they describe.

This new OLS[4] provides the following functionality: 1) An ontology crawler that detects when external ontologies have changed 2) A search engine for querying ontology term meta-data 3) Web services for querying the structure of the ontology 4) A user interface for exploring and visualising the ontologies 5) A versioning system to track ontology evolution using the DIACHRON platform that allows us to detect changes at the level of individual terms between ontology releases.

The new OLS system has been designed to provide standalone components for developers looking to incorporate ontologies into their own applications. These components work with any ontology represented in OWL and are not tied to the life science domain. These components include generic ontology indexer for Apache-Solr to build a search index over one of more ontologies along with an OWL ontology loader for the Neo4J graph database. We also provide a range of Javascript-based components for visualising ontologies.

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[1] http://www.ebi.ac.uk/ontology-lookup/

[2] http://bioportal.bioontology.org

[3] http://www.ontobee.org

[4] http://www.ebi.ac.uk/ols/beta