Ontodog: A Web-based Ontology Community View Generator

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ABSTRACT

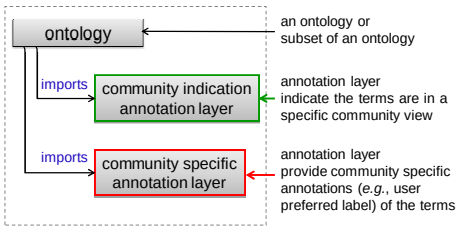
Reference ontologies are often very large and complex. When applied to a specific application, generally a subset of one reference ontology is needed. Moreover, the labels of ontology terms that were given in the perspective of ontology developers might not be preferred labels to the end users. Therefore, it is desirable to have a community view of a reference ontology that is a subset of the ontology including the terms needed for a particular application or community with user-preferred labels. Ontodog is a web-based system to support generation of ontology community views. Ontodog allows users to provide terms of interest in a source ontology and customized annotation information, such as user-preferred label. With these inputs, Ontodog can extract a subset of the source ontology containing all the terms of interest and generate user specified annotations in RDF/XML format (i.e., OWL files) which can be used to build an ontology community view. Currently over 100 ontologies including all OBO Foundry ontologies are available in Ontodog to generate views for a specific application or community. We demonstrate the application of Ontodog in generating ontology community views using the Ontology for Biomedical Investigations (OBI) [1] as the source ontology.

Ontodog website: http://ontodog.hegroup.org/

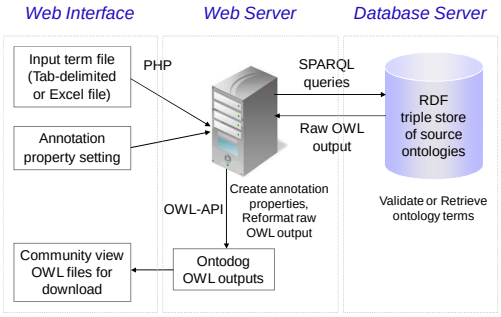
Ontology Community View

- a subset of the whole ontology or tagged subset of terms in the whole ontology to meet users' specific need
- contains user specified annotations (*e.g.*, user preferred label) where needed

Ontology Community View



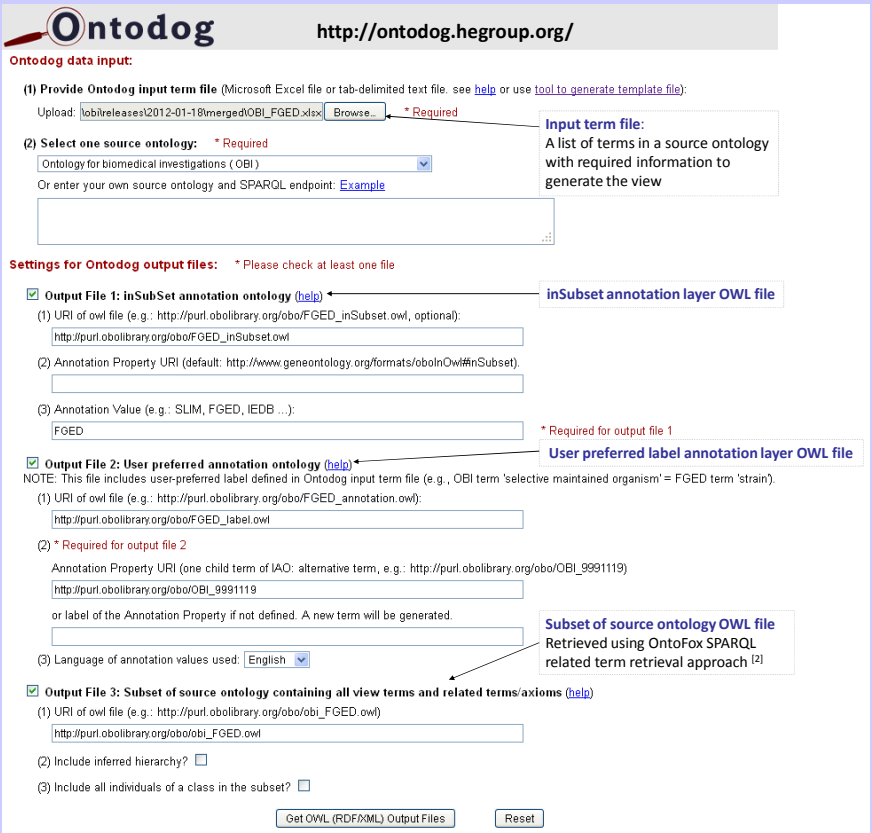
System Architecture



Ontodog workflow

1. The input data is processed using PHP.
2. SPARQL queries are issued against an RDF triple store to validate whether terms exist in the source ontology or retrieve terms from the source ontology
3. OWL-API is used to create annotation properties and reformat the files in RDF/XML format as output files.
4. Then the RDF/XML format output files are provided to the users for download.

Features and Usage



Input term file (tab-delimited or Excel file, template file can be generated by Ontodog)

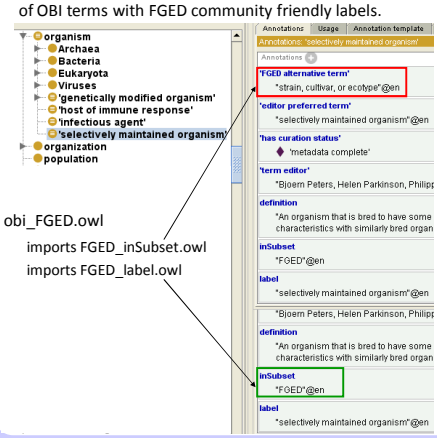
A	B	C	D	E
Source ontology term IRI	Source ontology term label	Include in View	User-preferred label	Include all children
http://purl.obolibrary.org/obo/OBI_0001182	negative binding datum	y		
http://purl.obolibrary.org/obo/OBI_0001183	epitope protection from tumor challenge experiment			
http://purl.obolibrary.org/obo/OBI_0001184	epitope protection experiment			
http://purl.obolibrary.org/obo/OBI_0001185	selectively maintained organism	yes	strain, cultivar, or ecotype	y

indicate terms are chosen for inclusion in the view

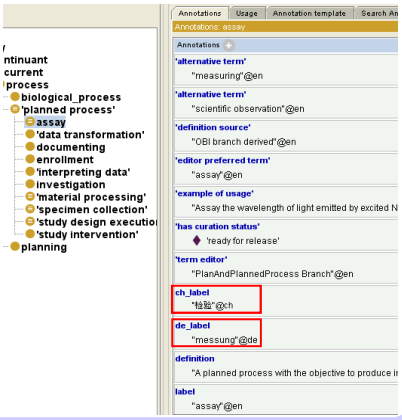
indicate all children of the chosen term will be included in the view

Use Cases: OBI FGED View, OBI Core

OBI FGED view: a view generated for the Functional Genomics Data (FGED) community, a simplified set of OBI terms with FGED community friendly labels.



OBI core: a view contains all OBI core terms with labels in different languages



References:

1. Brinkman RR, *et al* (2010) Modeling biomedical experimental processes with OBI. *J. Biomed. Semantics*. 1(Suppl. 1), S7.
2. Xiang Z, *et al* (2010) OntoFox: web-based support for ontology reuse. *BMC Res Notes*. 3:175.

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Summary

- A web system that generates ontology community views with customized annotations
- Easy to use with minimal ontology knowledge and no installation required
- Currently only supports ontologies in OWL format

* Authors contribute equivalently