NCBO BioPortal Version 4

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ABSTRACT

The BioPortal web application of the National Center for Biomedical Ontology is a resource that provides access to more than 600 biomedical ontologies. BioPortal users can browse ontologies with any web browser and search for terms across all the ontologies. Users may also access all ontology content and metadata through a Web services interface; many users have taken advantage of this feature to build applications on top of BioPortal. We present here the most recent updates to the system, featured in version 4 of the BioPortal software – roughly corresponding to the past year, as well as planned extensions to BioPortal.

NEW FEATURES AND UPDATES

In the version 4 release of BioPortal, we have introduced a series of changes and new features to make it easier both to use the web interface to explore ontologies, and to access the system through web services. We summarize these changes below.

Search: The search system allows a user to search for a class in all of the ontologies in BioPortal. We have revised this system to fetch matches not only according to class names and synonyms, but also on other fields such as UMLS CUI and ID. Additionally, we have reworked the search results display to highlight the distinction between ontologies that define a class and those that simply reuse or import a class.

Annotation: The annotator allows a user to submit text to the system and have the system return classes that match concepts in the submitted text. We have revised the annotation system so that new ontologies, and revisions of existing ontologies, are available for annotation within hours of their being loaded into the system. Previously this process took weeks or months.

Mappings: The mappings system records relationships between classes in different ontologies. These relationships can be generated manually (by users) or automatically (by the system). We have revised the mappings system to significantly reduce the resources required, and to substantially speed up their retrieval. Moreover, our collaborators at the University of Victoria have generated a new system for visualizing mappings between sets of ontologies.

Resource Index: The Resource Index is a pre-compiled set of annotations for all ontologies in BioPortal over the contents of a publicly available resource (such as PubMed abstracts). We have re-engineered the Resource Index to improve its scalability, now allowing us to index all years of PubMed and about 50 other biomedical resources.

Ontology Recommender: The Ontology Recommender is a system that helps users identifying ontologies of interest in a particular domain; it accepts text and returns ontologies that are most relevant for annotating this text. We have re-engineered this tool to provide better recommendations, and have provided mechanisms for users to fine-tune the ranking system to better suit their needs.

Usage Metrics: We now make usage metrics for ontologies available in the UI for ontology authors, and others to view. These metrics include the number of views of all ontologies in the previous month, and a graph of the number of views for a given ontology in the previous 18 months. We make these and other ontology access metrics available via the programmatic API.

CSV and RDF Downloads: We now allow users to download ontologies in both CSV and RDF formats. These features make it easier for users to manipulate ontologies in a spreadsheet (CSV) and/or to load them into a triple-store (RDF).

API Improvements: We have completely revised the API to be consistent across all of the functionality in BioPortal. We also now provide a number of API parameters that allow a user to specify exactly which fields to return. This feature can greatly speed up processing since the system does not have to look up and transfer unnecessary fields back to the client, only to then have the client discard them.

FUTURE PLANS

In the coming year we have plans for additional enhancements to BioPortal that will be outlined in the presentation.

ACKNOWLEDGEMENTS

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