Geophysical Research Abstracts
Vol. 14, EGU2012-12859, 2012
EGU General Assembly 2012

Configurable User Interface Framework for Data Discovery in Cross-Disciplinary and Citizen Science

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Use cases for data discovery and analysis vary widely when looking across disciplines and levels of expertise. Domain experts across disciplines may have a thorough understanding of self-describing data formats, such as netCDF, and the software packages that are compatible. However, they may be unfamiliar with specific vocabulary terms used to describe the data parameters or instrument packages in someone else's collection, which are often useful in data discovery. Citizen scientists may struggle with both expert vocabularies and knowledge of existing tools for analyzing and visualizing data. There are some solutions for each problem individually. For expert vocabularies, semantic technologies like the Resource Description Framework (RDF) have been used to map terms from an expert vocabulary to layperson terminology. For data analysis and visualization, tools can be mapped to data products using semantic technologies as well.

This presentation discusses a solution to both problems based on the S2S Framework, a configurable user interface (UI) framework for Web services. S2S unifies the two solutions previously described using a data service abstraction ("search services") and a UI abstraction ("widgets"). Using the OWL Web Ontology Language, S2S defines a vocabulary for describing search services and their outputs, and the compatibility of those outputs with UI widgets. By linking search service outputs to widgets, S2S can automatically compose UIs for search and analysis of data, making it easier for citizen scientists to manipulate data. We have also created Linked Data widgets for S2S, which can leverage distributed RDF resources to present alternative views of expert vocabularies. This presentation covers some examples where we have applied these solutions to improve data discovery for both cross-disciplinary and non-expert users.