User-Aware Multi-Dimensional Data Exploration for Deep Carbon Observatory

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Abstract Data discovery has become a big issue along with recent trends in Big Data. Due to the heterogeneity of the datasets and domain specific characteristics, data need to be visualized accordingly with different temporal, spatial and logical dimensional features. Many data portals have been developed to provide an intuitive approach for viewing the dataset. However, most of the data portals do not consider the dimension of people: users with different expertise might wish to view the the data from different perspectives. In this work, we extend the S2S (Rozell et al.) work to enable customized data visualization based on a user’s profile. Meanwhile, the platform provides programmable interfaces for extending visualization widgets such that a community can both benefit from and contribute to the visualization platform. We demonstrate our work based on datasets from the Deep Carbon Observatory (DCO) VIVO platform.

DCO Object Browser (http://data.deepcarbon.net/browsers/objects.html)

DCO Science Network (http://deepcarbon.net/page/dco-science-network)

The DCO Object Browser (upper left) is an example of what we have been working on to facilitate the discovery and exploration of DCO data and metadata. With this semantically enabled faceted browser,

- Scientists can access various DCO data objects (e.g. datasets) of their interests from multiple dimensions (e.g. associated communities) right in the web browser.
- Data managers can focus on what data to provide to the users rather than how to present and publish them.
- Developers can control the presentation of the information by creating new facet widgets or removing undesired ones.

Based on the same structured and semantics-embedded data as used by our browser, the DCO Science Network (upper right) provides an overview of the worldwide distribution of DCO researchers. This map features a dynamic visualization that presents the backend data in real time.