Promoting scientific collaboration and research through integrated social networking capabilities within the OpenTopography Portal

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LiDAR (Light Distance And Ranging) topography data offer earth scientists the opportunity to study the earth's surface at very high resolutions. As a result, the popularity of these data is growing dramatically. However, the management, distribution, and analysis of community LiDAR data sets is a challenge due to their massive size (multi-billion point, mutli-terabyte). We have also found that many earth science users of these data sets lack the computing resources and expertise required to process these data. We have developed the OpenTopography Portal to democratize access to these large and computationally challenging data sets.

The OpenTopography Portal uses cyberinfrastructure technology developed by the GEON project to provide access to LiDAR data in a variety of formats. LiDAR data products available range from simple Google Earth visualizations of LiDAR-derived hillshades to 1 km^2 tiles of standard digital elevation model (DEM) products as well as LiDAR point cloud data and user generated custom-DEMs. We have found that the wide spectrum of LiDAR users have variable scientific applications, computing resources and technical experience and thus require a data system with multiple distribution mechanisms and platforms to serve a broader range of user communities.

Because the volume of LiDAR topography data available is rapidly expanding, and data analysis techniques are evolving, there is a need for the user community to be able to communicate and interact to share knowledge and experiences. To address this need, the OpenTopography Portal enables social networking capabilities through a variety of collaboration tools, web 2.0 technologies and customized usage pattern tracking. Fundamentally, these tools offer users the ability to communicate, to access and share documents, participate in discussions, and to keep up to date on upcoming events and emerging technologies.

The OpenTopography portal achieves the social networking capabilities by integrating various software technologies and platforms. These include the Expression Engine Content Management System (CMS) that comes with pre-packaged collaboration tools like blogs and wikis, the Gridsphere portal framework that contains the primary GEON LiDAR System portlet with user job monitoring capabilities and a java web based discussion forum (Jforums) application all seamlessly integrated under one portal. The OpenTopography Portal also provides integrated authentication mechanism between the various CMS collaboration tools and the core gridsphere based portlets.

The integration of these various technologies allows for enhanced user interaction capabilities within the portal. By integrating popular collaboration tools like discussion forums and blogs we can promote conversation and openness among users. The ability to ask question and share expertise in forum discussions allows users to easily find information and interact with users facing similar challenges. The OpenTopography Blog enables our domain experts to post ideas, news items, commentary, and other resources in order to foster discussion and information sharing. The content management capabilities of the portal allow for easy updates to information in the form of publications, documents, and news articles. Access to the most current information fosters better decision-making. As has become the standard for web 2.0 technologies, the OpenTopography Portal is fully RSS enabled to allow users of the portal to keep track of news items, forum discussions, blog updates, and system outages. We are currently exploring how the information captured by user and job monitoring components of the Gridsphere based GEON LiDAR System can be harnessed to provide a recommender system that will help users to identify appropriate processing parameters and to locate related documents and data.

By seamlessly integrating the various platforms and technologies under one single portal, we can take advantage of popular online collaboration tools that are either stand alone or software platform restricted. The availability of these collaboration tools along with the data will foster more community interaction and increase the strength and vibrancy of the LiDAR topography user community.