Facilitating State-Of-The-Art Geodesy

The GEON LiDAR Workflow as a Distribution Pathway for Forthcoming GeoEarthScope LiDAR Datasets

Christopher J. Crosby » School of Earth and Space Exploration, Arizona State University
J Ramon Arrowsmith » School of Earth and Space Exploration, Arizona State University
Efrat Frank » San Diego Supercomputer Center, University of California, San Diego
Viswanath Nandigam » San Diego Supercomputer Center, University of California, San Diego
Han Suk Kim » Department of Computer Science and Engineering, University of California, San Diego
Jeffrey Conner » School of Earth and Space Exploration, Arizona State University
Ashraf Memon » San Diego Supercomputer Center, University of California, San Diego
Chaitan Baru » San Diego Supercomputer Center, University of California, San Diego
Newton Alex » School of Earth and Space Exploration, Arizona State University

The forthcoming GeoEarthScope LiDAR topography acquisition offers an unprecedented opportunity to examine the strain field adjacent to major active faults in the western United States at time scales greater than those provided by the current Plate Boundary Observatory geodetic instrumentation. These datasets will be exceptionally valuable for geologic slip rate studies, paleoseismic research, and as a pre-earthquake representation of the landscape should an event occur in the near future. These datasets will be utilized extensively and must be available to the EarthScope community as quickly and as easily as possible.

Traditionally, access to community LiDAR datasets is difficult because of the massive volumes of data generated by LiDAR technology. Thus, the tremendous volume of data generated by the forthcoming GeoEarthScope LiDAR acquisition effort could potentially be a significant barrier for user community access and processing of these data. To address the challenges posed by the distribution and processing of community LiDAR datasets, we have applied a geoinformatics approach that capitalizes on cyberinfrastructure developed by the GEON project (http://www.geongrid.org).

The Internet-based resource we have developed, known as the GEON LiDAR Workflow (GLW), is designed to democratize access to these challenging datasets and provide tools to enable users to perform basic processing of the data (e.g., generating digital elevation model (DEMs)). As a proof of concept, we have made four community LiDAR datasets available via the GLW. Our approach utilizes a comprehensive workflow-based solution that begins with user-defined selection of a subset of point data from an Internet-based portal and ends with download and visualization of DEMs and derived products. This approach allows users to carry out computationally intensive LiDAR data processing without having appropriate resources locally.

With the expectation of GeoEarthScope LiDAR datasets being delivered via the GLW, we are currently in the process of improving system stability, documentation and portal usability, adding processing capacity, and providing new job monitoring and job archiving capability. The distribution of GeoEarthScope LiDAR topography via the GLW represents an excellent example of utilizing cyber infrastructure to facilitate access to computationally challenging community datasets.

References:

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